

# Duke Med

ALUMNI NEWS Spring 2020



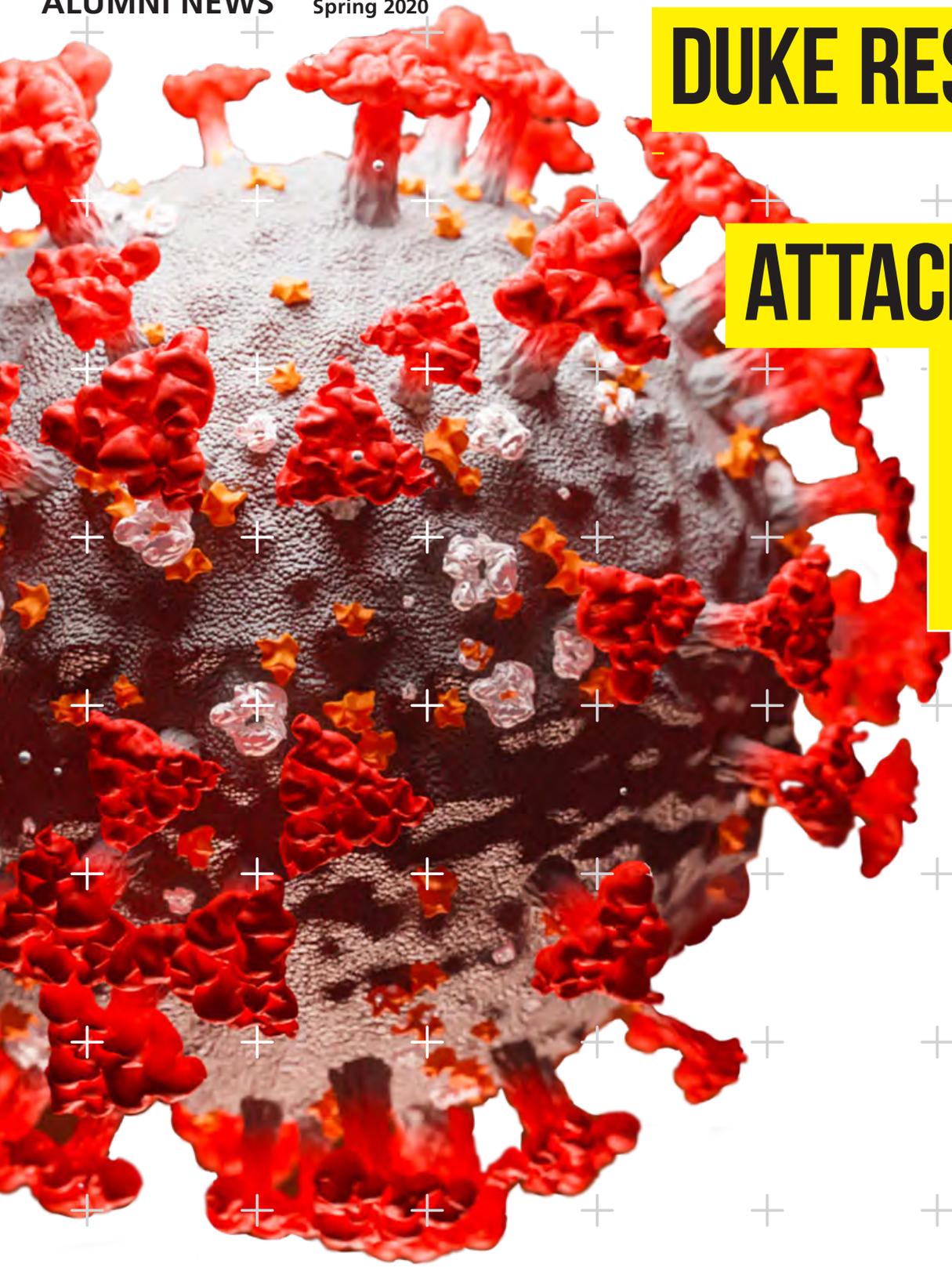
## DUKE RESEARCHERS PIVOT TO ATTACK COVID-19

Experts with decades of experience in unraveling the mysteries of viruses launch an all-out effort to stem the outbreak—and prevent the next one.

DUKE-NUS PIONEERS  
AN ANTIBODY TEST

MEDICAL EDUCATION  
PROGRAMS ADAPT

TIMELINE OF  
A PANDEMIC



## MESSAGE FROM THE DEAN

DEAR FRIENDS,

I hope you and your families are doing well. Just a few short months ago, who could have imagined what was in store for our nation and world? We are now facing unprecedented challenges caused by COVID-19.

I am beyond proud of how rapidly, skillfully, and courageously the School of Medicine and our entire Duke team have responded—but I am not surprised by it. As one of the nation's premier academic health care institutions, it is our mission and our responsibility to respond to the greatest health care challenges of our time. This is what we do. This is why we're here.



Our colleagues and leaders in the health system have been extraordinary in their efforts to care for our patients and prepare to ensure we are ready to care for additional patients—all while keeping our health care providers safe. To date, hundreds of providers have trained to deliver virtual care via telemedicine, and drive-through testing sites have

been established across our system.

And true to our mission as an academic health system, we have pivoted our research to focus on the problem at hand. We have scaled up our clinical research efforts focused on COVID-19. In March, Duke University joined the first national study to test a potential therapy for COVID-19, giving hospitalized adult patients with significant symptoms an option to participate. And in early April, the Duke Clinical Research Institute designed and launched a study to test a treatment for health care workers across the nation who are at high risk of contracting this novel coronavirus.

A similar seismic shift has occurred in our laboratory-based research. Scientists have turned their efforts to focus on COVID-19. Our research teams here in Durham and at our Duke-NUS Medical School in Singapore are making critical contributions. Some of the world's most skilled and experienced researchers are at Duke and are rapidly working to develop countermeasures through the development of a therapeutic antibody and a vaccine to combat COVID-19. (See page 2.)

Duke is well equipped for this work. Almost 20 years ago, we became home to one of the nation's National Institutes of Health-funded Regional Biocontainment Laboratories, a secure state-of-the-art facility ideally suited for working with new and infectious pathogens. Our own Good Manufacturing Practice (GMP) facility on campus allows us to produce candidate vaccines for testing. This means that we have the ability at Duke to discover, develop, test, manufacture, and deliver new treatments to patients.

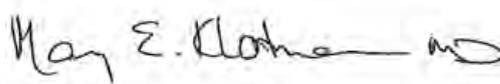
Duke-NUS Medical School has been a leader in this fight from the beginning as well. It was among the first groups outside of China to isolate and culture the live virus, which has provided a foundation for many studies and collaborations, and also developed one of the first serological tests for COVID-19. (See page 4.)

Consistent with our history in patient care and research, Duke is leading and contributing at a local, national, and international level, and we are partnering with our clinical and scientific colleagues all over the world to ensure we are all using the resources, knowledge, and experience that everyone can bring to this fight!

Our education efforts had to rapidly adapt as well. Our innovative leaders and dedicated students in professional and graduate education have transitioned to virtual classes so that the learning continues. In March, Match Day was held virtually, but celebrated nonetheless! A total of 115 Duke Med students participated and are headed to some of the nation's most prestigious residency programs. We are quite fortunate that 28 of our graduating students will be remaining here at Duke!

Thank you for the messages of support, expressions of concern, and offers of help that so many of you have extended. They sustain us as we battle this scourge. Please continue to heed the directives of your local community leadership regarding social distancing. We truly are all in this together, and we can all be part of the solution!

Sincerely,



**Mary E. Klotman, BS'76, MD'80, HS'80-'83, HS'83-'85**  
Dean, Duke University School of Medicine,  
Vice Chancellor for Health Affairs, Duke University

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## CONTENTS



PAGE 10



PAGE 12



PAGE 18

## NEWS BRIEFS

- 2 COVID-19 NEWS
- 24 KAELIN WINS NOBEL PRIZE
- 24 SOM AGAIN RANKED AMONG NATION'S BEST

## RESEARCH BRIEFS

- 28 INAUGURAL RESEARCH WEEK DRAWS HUNDREDS
- 28 HUMANS HAVE SALAMANDER-LIKE ABILITY TO REGROW CARTILAGE

## ALUMNI SPOTLIGHT

- 40 MAKING THE JUMP
- 42 FROM ETHICIST TO ACTIVIST

## ET CETERA

- 32 PEOPLE NEWS
- 38 CLASS NOTES
- 44 OBITUARIES

## FEATURES

### 4 DUKE RESEARCHERS PIVOT TO ATTACK COVID-19

Experts at Duke have amassed decades of experience unraveling the mysteries of viruses

### 12 LOOKING FOR DISEASE IN A GLOBAL HOTSPOT

### 18 BALANCING ACT

How the Section of Surgical Disciplines excels in both research and clinical care

### 35 MEDICAL ALUMNI ASSOCIATION AWARDS

## VIDEO LINKS



### DEAN KLOTMAN:

Hear the Dean's latest message about the School of Medicine's response to COVID-19.

[bit.ly/DMAN-deansmessage](https://bit.ly/DMAN-deansmessage)



### PRESIDENT'S MESSAGE:

Listen to President Price discuss how Duke is responding to the outbreak.

[bit.ly/DMAN-presidentsmessage](https://bit.ly/DMAN-presidentsmessage)



### HOW YOU CAN HELP:

Duke is leading and contributing to the fight to defeat COVID-19 and care for those affected.

[bit.ly/DMAN-covid19research](https://bit.ly/DMAN-covid19research)

## RESEARCHERS SEEK TO UNDERSTAND WHY SOME PEOPLE INFECTED WITH CORONAVIRUS FARE WORSE

When infected with SARS-CoV-2, why do some people—such as smokers and older adults—have extreme respiratory and cardiovascular distress while others have no symptoms at all?

A multi-disciplinary Duke team including a virologist, pulmonologist, and a pediatrician are working to answer this question by studying a surface molecule found on the thin layer of epithelial tissue that lines the lungs, heart and most other organs in the body.

The molecule, called angiotensin-converting enzyme 2 (ACE-2), is primarily known for lowering blood pressure; however, it is also a known entry point into cells for SARS-coronaviruses. The team is investigating whether this molecule and the partners it interacts with inside the cell are expressed differently in populations who often have extreme COVID-19 symptoms.

“The hypothesis we are working on is that, in smokers, the receptor is expressed at higher levels compared to non-smokers, which would give the virus additional ‘ports of entry’ and therefore facilitate its spread from one cell to another,” said virologist Maria Blasi, PhD, assistant professor of medicine and a member of the Duke Human Vaccine Institute.



Maria Blasi

To study the receptor, the team is using a model that pulmonologist **Scott Palmer, MD'93, HS'93-'96, HS'99**, professor of medicine, immunology and population health sci-

ences, has used in the past to assess the impact of smoking and vaping on airway cells.

With the help of Sallie Permar, MD, PhD, professor of pediatrics, immunology, pathology and molecular genetics and microbiology, and a member of the Duke Human Vaccine Institute, the team is also examining both young and old non-human primate lung epithelial cells isolated by collaborators at the California National Primate Research Center, by infecting them with the virus to define the host factors that mediate protection from severe SARS-CoV-2 disease in children. So far, children who have tested positive for COVID-19 are typically either asymptomatic or have few symptoms.



SHAWN ROCCO

Cameron Oswalt, MD, Karina Mora Massad, MD, Daniel Rosenkrans, MD and respiration therapist William Poorboy check monitors in Duke University Hospital ICU.

## DCRI Expedites Study of COVID-19 Prevention for Health Care Workers

The Patient-Centered Outcomes Research Institute has funded up to \$50 million to evaluate hydroxychloroquine as a preventive drug for the novel coronavirus.

A new rapid-response study designed and led by the Duke Clinical Research Institute (DCRI) seeks to engage health care workers across the nation to understand the impact of COVID-19 on their health and to evaluate whether hydroxychloroquine can prevent COVID-19 infections in health care workers at high risk of contracting this novel coronavirus.

The launch of the Health care Worker Exposure Response and Outcomes (HERO) research program was announced by the Patient-Centered Outcomes Research Institute (PCORI),

whose board of governors approved up to \$50 million to support the program. The program will engage the powerful PCORI-funded PCORnet®, the National Patient-Centered Clinical Research Network, which is an established health research network involving more than 850,000 clinicians and hundreds of health systems across the U.S. The study results will be shared widely with the health care community.

The program will initially consist of two parts, a national registry and a randomized clinical trial. The registry will seek to rapidly identify and enroll a large community of health care workers at high risk for COVID-19 infection. The randomized clinical trial will examine whether hydroxychloroquine is effective in decreasing the rate of COVID-19 infection.

## Duke Starts Novel Decontamination of N95 Masks to Help Relieve Shortages

Facing a critical shortage of N95 face masks that block the coronavirus, Duke Health research and clinical teams in March confirmed a way to use existing vaporized hydrogen peroxide methods to decontaminate the masks so they can be reused.

The process uses specialized equipment to aerosolize hydrogen peroxide, which permeates the layers of the mask to kills germs, including viruses, without degrading the mask material.

“This is a decontamination technology and

method we’ve used for years in our biocontainment laboratory,” said Scott Alderman, associate director of the Duke Regional Biocontainment Laboratory.

The decontamination process should keep a significant number of N95 masks in use at Duke University Hospital as well as Duke Regional and Duke Raleigh hospitals, easing some of the shortage and curbing the need for other alternatives using unproven decontamination techniques.

## School of Medicine Hosts Virtual COVID-19 Research Day

More than 700 faculty, staff and students tuned into the Duke University School of Medicine's first COVID-19 Research Forum, held virtually on April 17, 2020.

Thirty faculty members from across the school gave talks to highlight important work, share knowledge, discuss opportunities, and encourage partnerships and collaboration.

Keynote talks were given by Chris Woods, MD, professor of medicine and global health, and Bart Haynes, MD, Frederic M. Hanes Distinguished Professor of Medicine and director of the Duke Human Vaccine Institute.

Woods gave an overview of the spread of COVID-19, moving from the first cases detected in Wuhan, China in December 2019 to its infection of more than 2 million people worldwide by mid-April. Woods noted that, as of April 17, there were more than 5,000 COVID-19 cases in North Carolina, with more than 100 deaths. However, he said, social distancing measures have drastically decreased the rate of transmission.

After Woods' overview and highlights of studies taking place at Duke to develop better treatment, a series of expert panels gave talks focused on the biology of the virus, how it spreads and evades the human immune system, development of a vaccine and therapeutics, and measures taken to offer the best care for COVID-19 patients and safety for health care workers.

Haynes shared information about Duke's rapidly evolving attempt to create a vaccine. Haynes' team is one of 70 teams around the world trying to find a vaccine. Haynes said the pandemic will continue at some level until a safe and effective vaccine is available.

"This is really a defining moment for the missions of academic health systems," said **Mary E. Klotman, BS'76, MD'80, HS'80-'83, HS'83-'85**, dean of Duke University School of Medicine. "It really is going to be the convergence of excellent health care, education, and science that is ultimately the solution."

## DUKE JOINS FIRST NATIONAL EFFORT TO TEST POTENTIAL COVID-19 THERAPY

Duke University Hospital has joined the first national study to test a potential therapy for COVID-19, giving hospitalized adult patients with significant symptoms an option to participate.

The investigational treatment, known as remdesivir, is an antiviral agent that was previously tested in humans with Ebola virus disease and has shown promise in animal studies against MERS and SARS, diseases that emerged from different strains of the coronavirus.

"Duke's participation in this national study creates an extra option for potential patients in our community who have serious complications from COVID-19," said **Cameron Wolfe, MD, HS'08**, the study's principal investigator. "Currently, there are no approved therapies for this disease, so we are eager to contribute in any way to help find ways to fight this global pandemic."

Participants in the study, designed to evaluate the safety and effectiveness of remdesivir, will be randomly assigned to either receive the therapy or a mock treatment. To assure the results are not biased, patients and their doctors will not know who receives the active therapy.

All potential participants will undergo a baseline physical exam before receiving treatment and must



Cameron Wolfe

have significant symptoms such as difficulty breathing, using supplemental oxygen or needing mechanical ventilation.

"The trial is limited to people in the hospital with more severe symptoms, because most people with COVID-19

will recover fine at home with no need for therapies," said **Emmanuel "Chip" Walter, MD, HS'90**, co-investigator on the study.

Participants in the investigational treatment group will receive a daily intravenous dosage of remdesivir for up to 10 days. The placebo group will receive a similar administration of inactive ingredients. Patients will be assessed daily for measurable changes in their conditions.

Trial data will be pooled from all the participating clinical sites roughly mid-way through the enrollment period and analyzed to determine whether changes should be made to the study's design.

If, at that midpoint, patients showed no benefit, the study could be halted, or revised to add another therapy that might boost the response.

## COVID-19 Response Funds

As the COVID-19 outbreak expands in our state and around the world, teams throughout Duke's hospitals, clinics, and research labs are actively monitoring and responding to the developing pandemic in countless ways. Duke is mobilizing to care for patients with the highest quality medical care and is advancing understanding of the virus in order to develop treatments and preventions.

Gifts to the **COVID-19 Response Funds** will be used to address the needs of patients and caregivers impacted by COVID-19, to enhance our researchers' efforts to develop and test new tools to combat the virus, and to support emerging areas of greatest need.

You can designate your gift to any one or more of three areas:

- **Area of Greatest Need**
- **Care Support**
- **Research Support**

[giving.dukehealth.org/covid-19-support](https://giving.dukehealth.org/covid-19-support)

# DUKE RESEARCHERS PIVOT TO ATTACK



Sarah Keinonen, a researcher in the Denny Lab, harvests lymphocytes in the Duke Regional Biocontainment Laboratory. These cells are from someone who has COVID-19 and will be used to study how the virus interacts with the immune system.

JIM ROGALSKI

# COVID-19

**IN THE RACE TO UNDERSTAND THE NEW CORONAVIRUS** and generate solutions, Duke research teams are well underway.

In fact, you could say they've been working on it for decades. Everything Duke experts have learned over the years about the spread of new diseases, the biology of viruses, and the techniques of developing treatments and vaccines is now being applied to the new coronavirus, SARS-CoV-2, and the illness it causes, COVID-19.

These experts work across the medical school and campus as well as abroad. They work in the Duke Human Vaccine Institute (DHVI), the Duke Global Health Institute (DGHI), and the Duke-NUS Medical School in Singapore, among many other centers, institutes, and departments. And they are collaborating with other experts across the globe.

Duke also has state-of-the-art facilities—some of which are uncommon on university campuses—that are speeding up the development of new treatments and vaccines.

“We’ve got years of experience working with viruses and other pathogens,” says Colin Duckett, PhD, vice dean for basic science

in the School of Medicine. “Because we have the infrastructure and highly trained experts, we’ve been able to pivot rapidly to confront this new challenge.”

## **SLOWING THE SPREAD**

Epidemiologists and those who work in global health are hard at work learning more about how the virus spreads, with the immediate goal of slowing the spread.

“If we string out cases over time, especially for those likely to have severe disease, our intensive care units won’t be overrun and we can help them survive,” says Gregory Gray, MD, PhD, FIDSA, professor of medicine in the Division of Infectious Diseases and member of the Duke Global Health Institute. He also has appointments at Duke-NUS Medical School in Singapore, Duke Kunshan University in China, and the Duke Nicholas School for the Environment.

Gray’s lab members are conducting investigations both in Durham and Singapore to discover how far the virus can travel in the air. The investigators are setting up bio-aerosol samplers at various distances from patient beds to collect and identify virus and virus particles. Current thinking suggests the virus doesn’t

BY MARY-RUSSELL ROBERSON

typically travel beyond two meters (six feet) from an infected person; Gray's studies will help confirm or revise this.

Gray, an epidemiologist, is also working to collect and analyze data related to close contacts of infected people to learn more about the incubation period and what sorts of interactions are likely to result in transmission. Refining those two pieces of information will improve mathematical models of the spread.

In the lab, Gray's team is starting work to identify animal reservoirs, which are animals in which a virus multiplies prolifically, often without causing symptoms. The etiology of SARS-CoV-2 hasn't been nailed down, but it may have started in bats as some other coronaviruses have, and then become amplified in animals that have more contact with humans, perhaps wild animals in markets or domesticated livestock. In any case, if animal reservoirs can be identified, limiting or modifying contact with those animals can slow the spread.

## DIAGNOSIS

Faced with rapid spread of disease and a limited supply of test kits available to the state, a variety of private labs and universities, including Duke and UNC-Chapel Hill, quickly developed their own tests for SARS-CoV-2. These tests

**Experts at Duke  
have amassed  
decades of  
experience  
unraveling the  
mysteries of  
viruses and how  
to slay them.**

provide a yes-or-no response to quickly identify patients who have been infected.

Other types of tests will be needed to facilitate treatment and research. For example, knowing how much virus is present could be useful. These kinds of assays are often used for HIV, where "viral load" guides treatment decisions.

The lab of Thomas Denny, chief operating officer of DHVI, develops these kinds of assays and assay validations in support of HIV clinical trials. Denny says the National Institute of Allergy and Infectious Diseases (NIAID) asked his lab and other labs it funds focusing on HIV assays to shift to the new coronavirus.

"We have expertise that can flip over and develop assays for other viruses," he says. "It's a frame shift. We've been doing things similar to this for HIV, for H1N1 and other flu viruses, and now we're working to do that for this virus."

Denny and others in DHVI work with partners in African countries, which have the potential to be hit hard by the combination of SARS-CoV-2 and high rates of HIV. Denny and others are anxious to share assays with those labs to help them respond to the new disease.

Denny's lab is also helping to validate assays created by others, including the University of Texas Medical Branch in Galveston. Speed was of the essence to help respond to the shortage of tests kits from the CDC. "Our work with the UT team was to get that done quickly so there would be an approved test kit that other institutions or labs could [use]," he says.

## TREATMENTS AND COUNTERMEASURES

Duke has been approved to participate in a nationwide clinical trial sponsored by NIAID evaluating remdesivir in patients hospitalized at Duke University Hospital with COVID-19.

Remdesivir is a broad-spectrum antiviral drug that was developed for use with Ebola and has since shown some effectiveness against severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), which are both coronaviruses.

Cameron Wolfe, MD, HS'08, associate professor of medicine, is the Duke lead on the trial. "The fact that our teams operationalized this substantive study in the space of a week or a week and a half is astonishingly fast-paced," Wolfe says. "It is a credit to folks in multiple departments. There hasn't been a single person who hasn't rolled up their sleeves and said, 'Let's make this happen.'"

In addition to getting the studies off the ground quickly, Wolfe expects data will also be available quicker than usual. "Because of the incredible efforts of individual people trying to make it happen, and the adaptive nature of the trial, we would anticipate getting nationwide, actionable data in a matter of



**"We've got  
years of  
experience  
working  
with viruses  
and other  
pathogens."**

COLIN DUCKETT

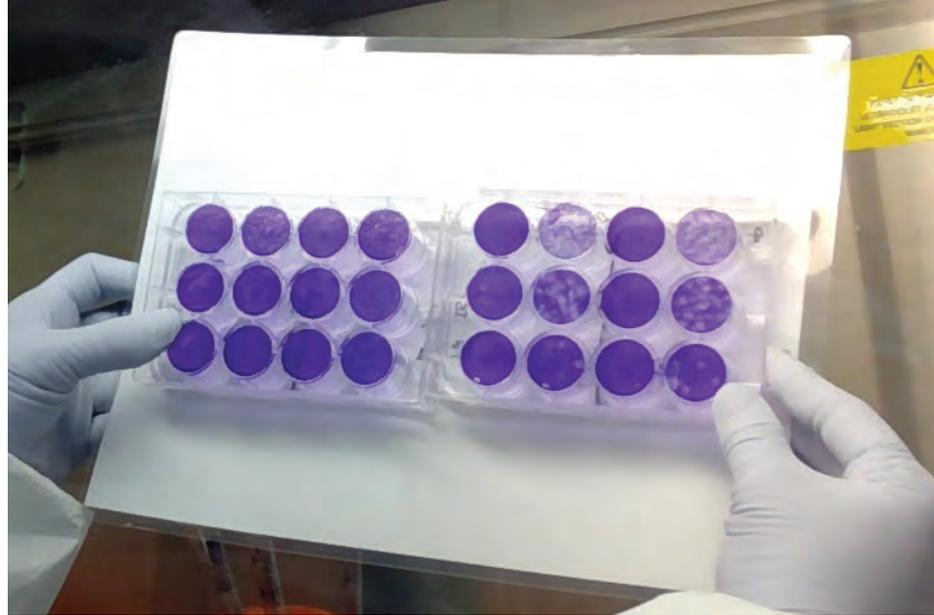
months, not the usual extended length of time,” he says.

Remdesivir is a so-called small molecule drug, as are most pharmaceuticals. A newer class of therapies are monoclonal antibodies, also called large-molecule drugs or biologics. These typically have the suffix “mab,” such as denosumab (Prolia) and pembrolizumab (Keytruda), and are given as injections or infusions rather than pills. Monoclonal antibodies may also prove to be a powerful tool in the fight against SARS-CoV-2.

Developing such a treatment is underway in the Duke Human Vaccine Institute (DHVI) in the lab of Greg Sempowski, PhD, professor of Medicine and Pathology. “My research program focuses on developing antibody treatments for viral pandemic pathogens,” he says. “This is a temporary treatment, or medical countermeasure, to help blunt or stop a pandemic in its tracks.”

An antibody treatment doesn’t confer lasting immunity as a vaccine does, but would help infected patients beat the disease. It also could be used as a temporary preventative for groups being exposed to the disease, such as health care providers or people in the military. “It’s something that would be a short-term measure while the vaccines are being developed, optimized and tested,” Sempowski says.

Sempowski’s lab is one of four nationwide that’s been funded for several years by the Defense Advanced Research Projects Agency (DARPA) to develop rapid responses to pandemics. That means, for any unknown virus, being able to isolate the virus and antibodies from humans that are infected, select the antibodies that can neutralize the virus, and engineer delivery methods for these antibodies.



THOMAS OGLIN

A plate shows where the virus has grown in the cells (blue area) and also where the virus has killed the cells (clear area).

DHVI has a state-of-the-art laboratory where highly trained specialized personnel work with potentially dangerous pathogens. The National Institutes of Health (NIH) funded the construction of 14 of these facilities about 15 years ago, including the one at Duke. “It’s a highly secure facility with redundant safety mechanisms so we can safely work with these materials to develop drugs, diagnostics, and therapeutics,” Sempowski says. “It’s an amazing resource for our region.”

The DHVI also has its own in-house Good Manufacturing Practices (GMP) facility, which makes small batches of vaccines and medical countermeasures for initial phase 1 clinical testing. This rapid and cost-effective in-house manufacturing saves precious time. The Duke University School of Medicine and DHVI also have robust clinical trials units, including the Duke Vaccine Trial Unit (DVTU), led by **Emmanuel “Chip” Walter, MD, HS’90**.

“At DHVI, we’re able to use in-house resources to rapidly go from bench to bedside,” Sempowski says.

Sempowski is pursuing a new technique that’s faster than engineering the antibodies themselves: creating genetic blueprints for the antibodies, in the form of messenger RNA (mRNA). When the mRNA is injected, the body follows the encoded instructions to make the antibodies itself.

“Switching to RNA-based manufacturing and delivery



“It’s a frame shift. We’ve been doing things similar to this for HIV, for H1N1 and other flu viruses, and now we’re working to do that for this virus.”

THOMAS DENNY

2019

2020

JANUARY

FEBRUARY

**December 1**  
The first known patient starts experiencing symptoms of COVID-19 in Wuhan, China.

**December 30**  
Twenty-seven patients, most of whom worked at the Huanan Seafood Market, are treated for a mystery illness. The illness was first thought to be a seasonal flu, MERS, or bird flu.

**January 11**  
China reports the first death from the COVID-19. The patient is a 61-year-old man in Wuhan.

**January 20**  
The World Health Organization (WHO) reports first cases in Thailand, Japan, and South Korea.

**January 21**  
The first confirmed case of the coronavirus in the United States is identified in Washington state.

**January 23**  
China places Wuhan under quarantine orders.

**February 9**  
The death toll in China rises to 811, surpassing the fatalities from SARS in 2003.

**February 14**  
The White House bans entry of foreign nationals who have traveled to China in the last 14 days.

could help accelerate manufacturing and delivery of both vaccines and countermeasures,” Sempowski says.

## VACCINES

Vaccines are designed to prevent rather than treat an infection or disease. Used in a vaccine, mRNA would tell the body how to make fragments of the SARS-CoV-2 virus called spike proteins. These would spur the body to produce antibodies and “memory cells” that could respond if confronted with the actual virus later.

The vaccine effort at Duke is led by the director of DHVI, Barton Haynes, MD, the Frederic M. Hanes Professor of Medicine. Haynes has long worked to develop a vaccine for HIV, a notoriously sneaky and frequently mutating virus. He leads a multi-institution consortia that has received hundreds of millions of dollars in funding from NIAID and the Bill and Melinda Gates Foundation since 2005.

NIAID Director Anthony Fauci, who was an early mentor of Haynes, recently told *Duke Magazine*, “You’re dealing with a superstar who is leading a very impressive group of people. If we’re going to get a vaccine for HIV, it almost certainly is going to be all or in part by this group.”

Haynes is now turning his focus to SARS-CoV-2 in an attempt to develop a mRNA-based vaccine, using all the combined expertise of his team and the DHVI in-house production facility and clinical trials unit. In this effort, Haynes is collaborating closely with Drew Weissman, MD, PhD, professor of medicine at the University of Pennsylvania.

“All of the past 15 years’ worth of work on the HIV vaccine has led to the development of the technologies that are now being used to rapidly respond to the COVID-19 pandemic,” Haynes said. “This includes the antibody-isolation technology we are using to isolate neutralizing antibodies and the rapid movement to vaccine and antibody production for clinical trials in our own vaccine production facility. Coupling these technologies with the state-of-the-art Regional



**“If we can show that this works, it will be a novel tool that would help us get ahead of these outbreaks.”**

GREGORY GRAY

Biocontainment Facility provides a powerful approach for rapid development of solutions to pandemics.”

Duckett says, “Bart Haynes is truly a pioneer in vaccine development, especially with his experience in HIV. His group is poised to make seminal contributions to the development of a vaccine for SARS-CoV-2.”

## PREVENTING FUTURE PANDEMICS

As an epidemiologist, Gray wants to be able to identify the next pandemic-causing virus *before* it causes a pandemic.

He is leading an effort to conduct a study at eight sites in six Asian countries to identify and keep tabs on zoonotic pathogens present in people who work in animal markets or who process meats. *See the story Looking for Disease in a Global Hotspot on page 12.* Benjamin Anderson, PhD, assistant professor of global health at Duke Kunshan University, will be leading the effort for three sites in China.

The immune systems of people who work closely with animals are repeatedly attacked or “insulted” by animal pathogens, but they usually are able to shrug it off. Sometimes, however, an animal pathogen adapts to life in a human host and gets better at multiplying in its new home. The real problem occurs when the pathogen begins moving from one human to another. “It’s a progression,” Gray says: “Insult, adaptation, effective replication, and then human-to-human transmission.”

The new project will harness genomic sequencing and big data tools to identify new pathogens that have adapted to the human respiratory tract and show transmission potential.

“That puts us ahead of the curve before the virus becomes highly effective at causing disease and human to human transmission,” Gray says. “If we can show that this works, it will be a novel tool that would help us get ahead of these outbreaks.”

*This story originally appeared in Magnify, the SOM online magazine at [bit.ly/DMAN-researcherspivot](http://bit.ly/DMAN-researcherspivot).*

# TIMELINE OF THE PANDEMIC

## MARCH

**February 19**  
President Trump announces additional travel restrictions from Iran, Italy, and South Korea.

**February 24**  
The U.S. stock market plummets over fears of the virus.

**February 29**  
The first U.S. patient dies in Washington state.

**March 3**  
Wake County reports the first positive case in North Carolina. The patient had recently traveled to Kirkland, Washington.

**March 8**  
Italy issues a lockdown to quarantine 16 million people in northern Italy. The lockdown is applied to the entire country two days later.

Duke University Hospital President Thomas A. Owens, MD, announces precautions for avoiding spread of the virus in the hospital.

**March 10**  
Duke University President Vincent Price announces that in-person classes have been suspended until further notice. Spring break—which is ongoing—is extended by a week. He also prohibits any gathering of more than 50 people.

**March 11**  
Students on spring break are told not to return to Duke campus.  
  
President Trump announces new restrictions on foreign travel from Europe for 30 days. Four days later the U.K. and Ireland are added to the restrictions.

**March 12**  
The NCAA cancels the men’s and women’s national basketball tournaments. President Price suspends all Duke athletic activities, including practices and competitions, for winter and spring sports.  
  
All buildings on campus are placed under controlled access. Managers are encouraged to prepare for having employees begin working from home where possible.

**March 13**  
Three Duke graduate students who had traveled to Israel test positive for COVID-19. Later the number of students infected increases to 15. An email says they will remain overseas until they recover.  
  
A Duke Health virtual town hall meeting provides the latest responses to COVID-19.

# Researchers at Duke-NUS Develop Antibody Test

**ON THE OTHER SIDE OF THE WORLD**, in Singapore, researchers at the Duke-NUS Medical School were among the first in the world to isolate the new virus, after China and Australia. They were also among the first to develop a blood test for antibodies to the virus, which makes it possible to identify people who have had COVID-19 even after they have recovered and cleared the virus.

The Duke-NUS Medical School was established in 2005 to provide graduate-level medical education in Singapore, which at the time had only medical schools that were designed for undergraduate entry.

“We were brought by explicit invitation of the Singapore government to establish a research-intensive school that would train students to become clinician-scientists,” says **Thomas Coffman, MD, HS’83-’85**, dean of the school.

The school is organized around interdisciplinary public health issues, one of which is emerging infectious diseases, which are a particular concern for Singapore. “This region has been a fountain of new viruses,” Coffman says.

The school’s Programme in Emerging Infectious Diseases is directed by Linfa Wang, PhD. Wang is an



**“This is my fifth emerging zoonotic disease outbreak, and they all look like bat-borne viruses.”**

LINFA WANG

expert in zoonotic viruses—those that jump from animals to humans, as SARS-CoV-2 did.

“I have been in this business for last 25 years,” Wang says. “This is my fifth emerging zoonotic disease outbreak, and they all look like bat-borne viruses. We were ready [for the current outbreak] in many ways.”

Several years ago, Duke-NUS established a biocontainment facility (an animal biosafety level 3 laboratory) in Singapore, which has been a critical resource for work during the current outbreak. And Wang explicitly trains his lab members, doctoral students, postdocs, and junior faculty to be prepared for outbreaks.

“As a basic scientist, I think this concept of peacetime and wartime is so important,” he says. “I always tell my junior scientists: during peacetime, publishing and working on your CV and grants are important, but during an outbreak, it’s about having an impact on the ground.”

Researchers at Duke-NUS, including Danielle Anderson, PhD, scientific director of the Duke-NUS biocontainment lab, isolated the live virus just days after receiving a sample from an infected patient at the end of January. Once the researchers had the virus and could grow it in the lab, they could begin developing a blood-based test to detect antibodies, called a serological test.

With that test in hand, the research team was able to use it to describe how a coronavirus outbreak in one church in Singapore led to an outbreak in another. A couple from one church, unknowingly infected, spent time with a man from the other church. Using

Continued on page 34

2020

## MARCH

**March 13**  
Duke University students are told classes will not take place on campus for the remainder of the semester. Faculty is asked to transition to remote course delivery. All buildings on campus are placed under controlled access. The Duke Chapel, Sarah P. Duke Gardens, Nasher Museum of Art, Duke Lemur Center, Rubenstein Arts Center, Athletics Hall of Fame, and Karsh Alumni and Visitors Center are all closed to visitors.

The Leadership Task Force updates laboratory guidelines, restricts visitors to hospitals and clinics, and limits vendor access to areas in the three Duke Health hospitals and clinics.

Duke University managers are encouraged to have employees work remotely when possible.

**March 14**  
Durham County announces its first COVID-19 patient.

**March 16**  
Governor Roy Cooper closes all public schools in North Carolina.

Duke Health hospitals and clinics begin operating with increased visitor screenings and restrictions in place to protect against the spread of COVID-19. The hospital and clinics designate screening areas at main entrance points for all hospital and clinic sites.

**March 18**  
In a virtual town hall, School of Medicine Dean Mary Klotman, MD, and three Duke experts discuss how Duke researchers have quickly mobilized to study the virus.

President Price announces that the scheduled May 2020 commencement is postponed until a later date.

Duke Health hospitals erect screening tents outside their main buildings. The tents keep potential COVID-19 patients separated from other patients and staff to reduce the chance of infection.

**March 19**  
The Duke Health Leadership Task Force provides swab collection kit instructions and testing guidelines. Elective and non-critical surgeries and procedures are rescheduled. The Task Force announces that there will be a high probability of redeployment of clinical and non-clinical employees.

**March 20**  
The first Duke health team member with COVID-19 is confirmed at Duke Raleigh Hospital.

School of Medicine Match Day is held virtually. Students are notified via email of the institutions where they will do their residencies.

Nationwide HIPPA privacy rules receive a temporary waiver to allow for teleconferencing between patients and medical staff.

**March 23**  
Duke University Hospital, Duke Regional Hospital, and Duke Raleigh Hospital announce that visitors will not be allowed “until further notice.” Limited exceptions are made for patients on hospice, in labor, or being discharged.

# Medical Education in a Time of COVID-19

**THE ARRIVAL AND RAPID SPREAD OF COVID-19** in mid-March disrupted virtually all normal operations at Duke. Administrators, faculty, students, and staff had to move quickly to revise plans, adapt procedures, move operations, and improvise on the fly.

For School of Medicine faculty and medical education leaders, the outbreak presented a unique challenge. COVID-19 hit mid-semester, and with on-campus instruction suspended and non-essential access to the hospitals and clinics restricted, the medical education teams had to invent new approaches to replace nearly all normal classroom, clinical education, and student research experiences. The MD, Physician Assistant, Doctor of Physical Therapy, and graduate medical education programs all had to convert to new ways of teaching and learning in a matter of days.

The MD program came up with separate strategies for each of the four cohorts of medical students, from first-year students still learning the basics to fourth-years just a few months way from beginning their residencies and internships.

“Our faculty got very creative in coming up with new ways to deliver instruction,” says Ed Buckley, MD, vice

dean for education. “And the medical education IT and AV folks have been outstanding in setting everybody up with platforms for remote delivery.”

Alison Clay, MD, assistant dean for clinical education, and Nancy Knudsen, MD, assistant dean for learning environment, even developed a crash course called “Responding to Pandemics: Past, Present, and Future,” to give medical students perspective on the current situation.

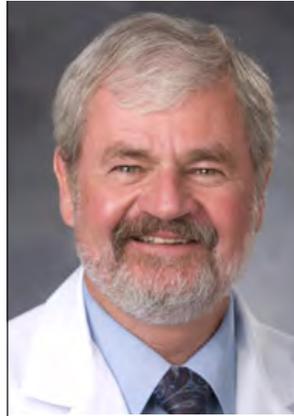
Under the Duke medical curriculum, the core basic sciences are taught during the first year. The School of Medicine’s “flipped classroom” model, which emphasizes small-group and problem-solving projects, turned out to be well-suited for transition to video chat and other virtual platforms. Most courses made that shift relatively smoothly.

The second-year clinical skills rotations were more challenging. Students rotate among core clinical clerkships in eight areas—medicine, surgery, pediatrics, and so on—seeing patients and learning to take histories, perform exams, and provide clinical care.

COVID-19 forced the school to pull those students out of the clinical environment and innovate a new timetable.

Each of the eight core areas includes a didactic component—lectures or small-group activities—along with the clinical experience. Since students can’t access the clinics, they are using remote learning platforms to “front-load” the didactics for all of their remaining clinical areas. That will take them until roughly mid-June—by which time administrators think they might be able to return to the clinics. Then, with all their

Continued on page 34



**“They could just as easily have said, ‘I’m going to go home and hibernate.’ Instead they’ve stepped up and said, ‘How can I help?’”**

ED BUCKLEY

## TIMELINE OF THE PANDEMIC

### APRIL

**March 24**  
The summer Tokyo Olympics are canceled until July 2021.

**March 25**  
Duke University Hospital joins a national effort to test a potential COVID-19 therapy. The treatment uses an antiviral agent called remdesivir that was previously tested in humans with Ebola virus disease and has shown promise in animal studies against MERS and SARS. Duke is set to begin enrolling eligible patients immediately.

U.S. Senate passes a \$2 trillion coronavirus response package designed to ease the economic blow from the pandemic.

**March 26**  
Reported U.S. COVID-19 cases surpass those reported from China.

The City of Durham enacts a stay-at-home order for all residents and businesses.

Duke Health begins screening all staff, faculty, and residents entering Duke Health facilities, regardless of clinical contact.

Duke Health researchers develop a method for safely decontaminating N95 masks, allowing them to be re-used and helping to relieve shortages. The masks are decontaminated using vaporized hydrogen peroxide.

**March 27**  
North Carolina Governor Roy Cooper issues a stay-at-home order for the entire state from March 30 through April 29.

**April 2**  
The U.S. Department of Labor releases figures that show a record 6.6 million Americans filed for unemployment benefits the previous week, a sign of the pandemic’s mounting toll on the U.S. economy.

**April 9**  
President Price announces measures to address the economic impact of the outbreak on the university, including a temporary freeze on salary increases and staff hiring.

**April 17**  
More than 700 attendees tune in to watch a virtual COVID-19 Research Forum presented by Duke University School of Medicine, at which 30 faculty members highlight research and share perspectives on COVID-19.

**April 24**  
Duke announces plans to phase in a return of faculty and staff over time in a coordinated process to ensure appropriate social distancing, availability of PPE (personal protective equipment), and testing capabilities for COVID-19.

**April 30**  
More than 60,000 deaths are reported from COVID-19 across the U.S. North Carolina reports 381 deaths.



Triage tents being set up outside the emergency department at Duke University Hospital in mid-March.



Left, to conserve and reuse N95 masks, Duke occupational and environmental safety employee Andrea Vogel hangs used masks that will be decontaminated with vaporized hydrogen peroxide.



Clare Smith, PhD, right, and Brook Heaton, PhD, prepare to culture COVID-19-infected blood cells in Duke's Regional Biocontainment Laboratory to isolate potential antibodies to fight the disease.

At right, Duke nurse Maureen Magner administers a COVID-19 test at a drive-through testing site at Duke University Hospital.





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Above, Duke respiration therapist William Poorboy checks a patient in the ICU. All Duke employees are required to wear a face mask while on the hospital campus and are screened every time they enter the hospital.

At left, Tena Shizuma helps Kimberly Hunter adjust her face mask as Duke staff enter the hospital.

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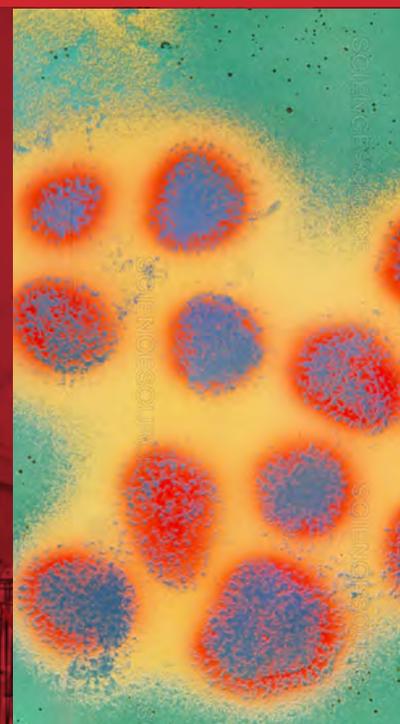
PHOTOS BY SHAWN ROCCO

**"It's really meaningful to take a step back from what we're learning in the textbook and see medicine in action in real life."**

**THAO NGUYEN**

Duke students Amanda Farrell and Thao Nguyen walk through a live bird market near Hanoi with Vietnamese infectious disease researchers.



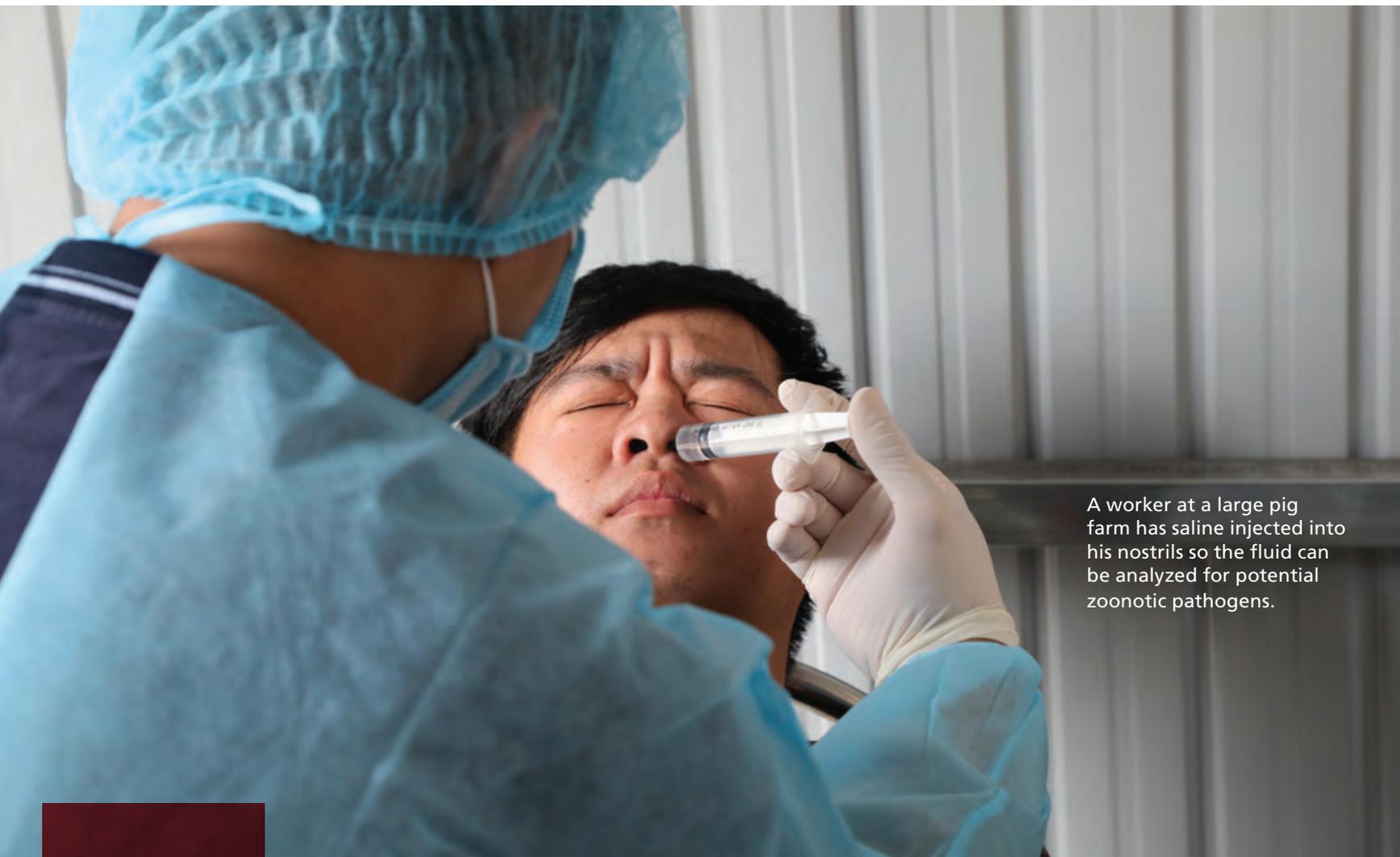


# LOOKING FOR DISEASE IN A GLOBAL HOTSPOT

It's an early November morning and third-year Duke medical students **Amanda Farrell, MSIII**, and **Thao Nguyen, AB'16, MSIII**, are walking through the massive, muddy, and malodorous Ha Vi live bird market near Hanoi, Vietnam, looking for potential disease.

They have come to the right place.

STORY AND PHOTOGRAPHS BY JIM ROGALSKI



A worker at a large pig farm has saline injected into his nostrils so the fluid can be analyzed for potential zoonotic pathogens.

The World Health Organization considers Vietnam a global hotspot for disease emergence, in part because it borders China, which is home to half a billion pigs and an equal number of poultry. As was proven with the current coronavirus pandemic that originally broke out in Wuhan, what happens in China doesn't necessarily stay in China.

"It's a sensory overload in every single way," Farrell says of the live bird market. But bird noise and foul smells are of little concern. Farrell

and Nguyen are embracing a unique opportunity to contribute to an international research study led by Duke that seeks to document Vietnam's zoonotic threat—diseases that can jump from animals to humans.

The project consists of researchers visiting various live bird markets and pig farms throughout northern Vietnam. They collect nasal washes and blood samples from workers, bioaerosol samples, and fecal matter and oral swabs from poultry and pigs.

## STUDENTS' THIRD-YEAR RESEARCH LANDS THEM IN VIETNAM

"This is an incredible international team, and I am grateful to be here," Farrell says.

### ON THE FRONT LINE

The two students look on as a team member from the Vietnamese National Institute of Veterinary Research (NIVR), injects a small amount of saline into a nostril of a young female market worker, who then spews the liquid into a cup. The fluid will be tested for pathogens at the National Institute of Veterinary Research (NIVR) labs in Hanoi.

"It looks uncomfortable, and I can't imagine doing that," Nguyen says.

"But when they're told of the importance of this study and how they can participate," Farrell adds, "they seem excited to do it."

For Nguyen, a Vietnamese American, her work in Hanoi represents a way to integrate her personal story with her clinical interest in global health.

"It's incredibly meaningful on a personal level to come back to my home country and be able to understand the diseases that are going on here," she says.

During their eight months in Vietnam, the

students are played key roles in the project as members of the lab teams processing the samples collected in the field.

“Their work is very important because they help us to get results more quickly, and they motivate our young staff,” says Bui Nghia Vuong, vice head of virology at NIVR. “They have a big influence here.”

#### UNIQUE THIRD-YEAR RESEARCH PROJECTS

Farrell and Nguyen also are conducting their own research as part of their Duke medical education. Nguyen’s third-year project is to determine the prevalence and risk of *Streptococcus suis*, a pathogen found in pigs that is the leading cause of meningitis in Vietnam.

Farrell is hunting for Influenza D virus among swine workers. It was first discovered in 2011 in pigs in Oklahoma and has jumped to bovine herds in the U.S., China, Japan, France, and Italy. She aims to determine if it exists in Vietnam and whether it has infected humans there.

Farrell says this type of international experience is precisely why she is at Duke University School of Medicine. Unlike most of peer institutions, Duke’s medical school curriculum devotes the entire third year to research and scholarly investigation.

“The third-year research year is such a unique opportunity,” Farrell says. “When I was



**“I contacted Duke Global Health and was told, ‘We have hundreds of opportunities. Whatever you want to do, we’ll support you all the way.’”**

AMANDA FARRELL

#### FOR MORE:

Watch this video to learn more about Duke’s pathogen surveillance in Vietnam:

[bit.ly/DMAN-vietnam](https://bit.ly/DMAN-vietnam)



Thao Nguyen, right, and a Vietnamese researcher examine a field sample at the Vietnamese Institute for Veterinary Medicine in Hanoi.

## COVID-19 OUTBREAK CURTAILS STUDENT PROJECTS

Amanda Farrell and Thao Nguyen had to cut their individual research projects in Vietnam short by three months when the severity and spread of COVID-19 became apparent.

While she was still in Vietnam, Farrell fell ill with a sickness that had the symptoms of coronavirus, but she was never diagnosed and made a full recovery. She was able to return to the U.S., but it wasn’t easy.

“I managed to get on the only international flight out the night that I left,” Farrell says. “The city fully shut down about three days later. It was very stressful.”

She said her research in Hanoi had to come to a complete stop. “So my final thesis will be incomplete,” she says. “Thankfully, Duke is allowing modified submissions for that.”

Nguyen was in the U.S. for a wedding, planning to go back to Vietnam afterward, when Hanoi ordered its city-wide lockdown. Nguyen said Vietnam quickly closed its borders to China and “were pretty rigorous with screening when it comes to people’s travel history, symptoms, etc.”

She was disappointed that she wasn’t able to return to say goodbye to friends and coworkers in Hanoi. “I’m hoping to go back again once things (eventually) settle down,” Nguyen says.

In the meantime, back at Duke, Farrell is working with their project leader, Gregory Gray, MD, MPH, professor of global health and infectious diseases, on a COVID-19 study.

The Duke One Health lab is studying the aerosolization of COVID-19 by collecting bioaerosol samples from COVID-19-positive patients and their hospital rooms at Duke.

The project also hopes to further characterize symptoms and risk factors by surveying both positive cases and tracing contacts. Farrell’s role is in the lab processing the samples collected.





Ha Long Bay is a UNESCO World Heritage Site and a popular tourist destination in northern Vietnam that Nguyen and Farrell visited on a day off.

planning it, I contacted Duke Global Health and was told, ‘We have hundreds of opportunities. Whatever you want to do, we’ll support you all the way.’”

Nguyen says the opportunity is invaluable.

“It’s really meaningful to take a step back from what we’re learning in the textbook and see medicine in action in real life,” he says.

“The Vietnamese team is putting their lives into this research, and that is beautiful to see.”

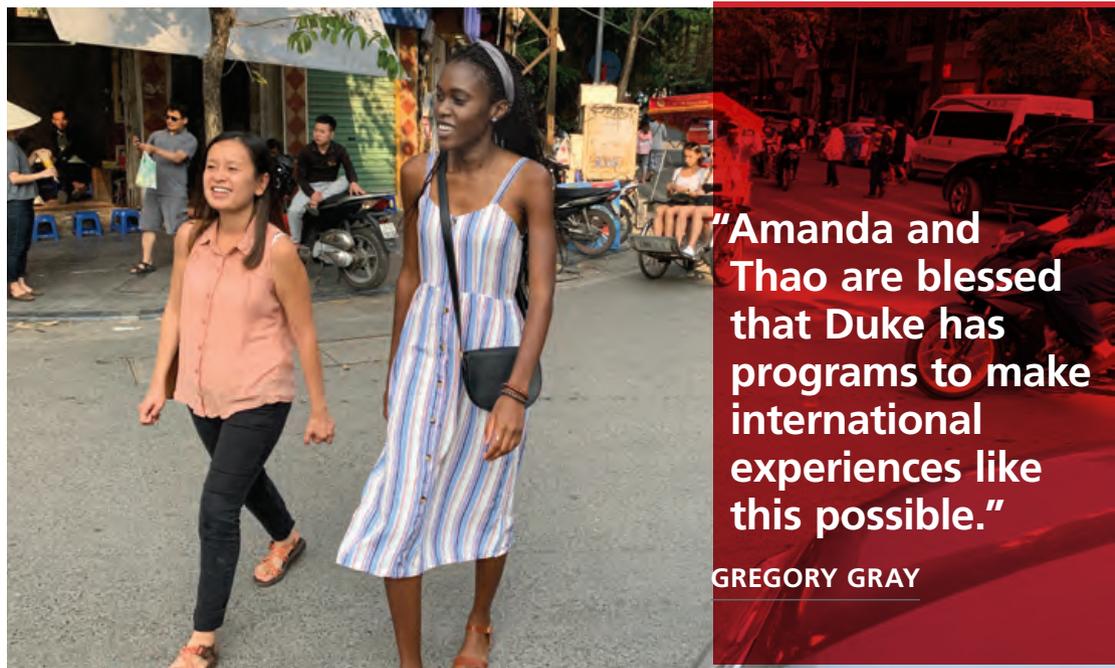
The Duke-Vietnam partnership is headed by Gregory Gray, MD, MPH, a Duke professor of global health and infectious diseases.

Gray, who also holds an appointment in the Nicholas School of the Environment, champions the “One Health” approach of health care, which encourages multidisciplinary collaboration across sectors to address public health threats such as zoonotic diseases. Human health is intimately tied to animal and environmental health, Gray points out.

“This is Duke’s recognition that what happens in the developing world can impact people of the United States quite rapidly,” Gray says. “Amanda and Thao are blessed that Duke has programs to make international experiences like this possible.”

#### EMBRACING THE CULTURE

The students say they easily settled into their new Vietnamese lifestyles and have forged friendships with their fellow lab mates and researchers. “They’re all roughly my age—26 or so,” Farrell says. “When we’re pipetting we have really good conversations. They’ve taught me so much about the Vietnamese culture. We



Nguyen and Farrell walk along a Hanoi street as they head to a grocery store.

feel really welcomed here.”

When not in the lab, or joining the team in the field, Farrell and Nguyen find plenty of ways to enjoy their host country, like exploring unique foods like eel and Bun Cha (pronounced BOON-chah), a noodle and grilled pork soup made notable by President Barack Obama when he praised it while visiting Hanoi with Anthony Bourdain in 2015.

“And Roti!” says Farrell. “It’s a small pastry that can be filled with chocolate or vanilla. It’s just really delicious and

kind of melts in your mouth.”

Day trips included visiting Ha Long Bay, a UNESCO World Heritage Site about three hours from Hanoi that features thousands of otherworldly limestone islands towering out of emerald green water.

“It’s quite a beautiful site,” Nguyen says.

Farrell is grateful that the School of Medicine builds these exceptional learning experiences into its medical curriculum.

“All of Southeast Asia is just majestic and a really stunning place,” she says. “So, yeah, I’m really happy that I chose Duke.”

**“Amanda and Thao are blessed that Duke has programs to make international experiences like this possible.”**

**GREGORY GRAY**

# DUKE TAPPED TO LEAD SEARCH FOR UNIVERSAL FLU VACCINE

**A**s part of a massive national effort to improve and modernize flu shots, the Duke Human Vaccine Institute (DHVI) received three research contracts from the National Institute of Allergy and Infectious Diseases (NIAID), with an initial award of approximately \$29.6 million in first-year funding.

The contracts are part of an ambitious initiative under NIAID aimed at developing a longer-lasting, more broadly protective vaccine to replace the seasonal flu shot. Current flu vaccines do not protect against all varieties of the virus and require new formulations each year. A more universally protective vaccine could cut the toll of influenza, which kills 300,000 to 500,000 people worldwide each year and causes up to 5 million cases of severe infection.

Duke is the only institution to receive a contract in each of the three CIVICs components, including work to design and evaluate influenza vaccine approaches, manufacture and evaluate the safety and toxicity of vaccine platforms, and conduct clinical trials for influenza vaccines.

The vaccine development component will be led by **M. Anthony Moody, BS'89, MD'99, HS'03**, associate professor in the departments of pediatrics and immunology at Duke University School of Medicine. Duke is one of three academic centers awarded the CIVICs vaccine development contracts. The DHVI



**M. Anthony Moody**



**Matthew R. Johnson**



**Emmanuel "Chip" Walter**

team will conduct basic immunology and virology research to identify potential vaccine candidates.

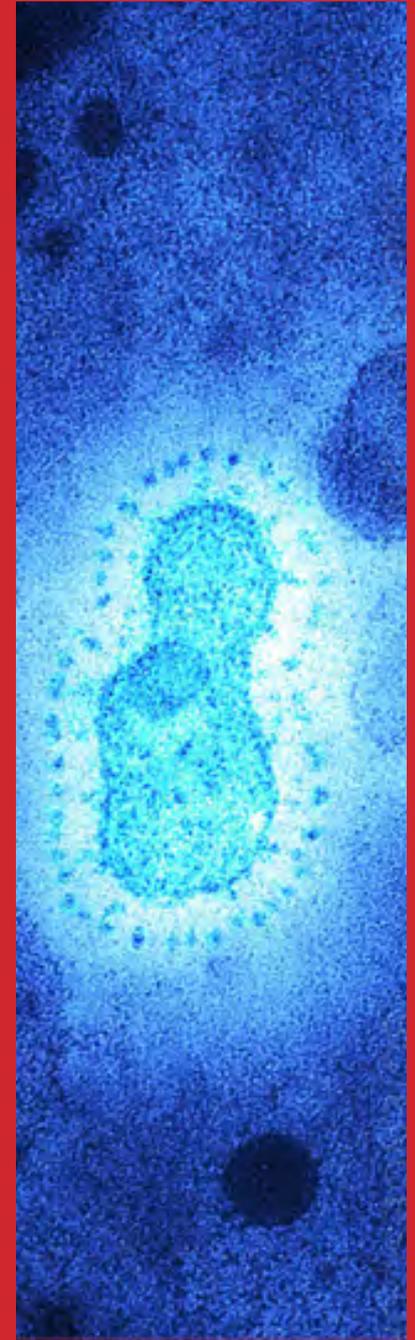
The second contract is for vaccine manufacturing and will be led by Matthew R. Johnson, PhD, senior director of product development at DHVI. Johnson oversees a facility within DHVI that meets Good Manufacturing Practice standards for the production of vaccine products used in proof-of-concept Phase I clinical trials.

The third contract for DHVI provides funding for clinical trials that test the vaccine candidates developed through the CIVICs program.

**A more universally protective vaccine could cut the toll of influenza, which kills 300,000 to 500,000 people worldwide each year...**

Duke is one of two centers receiving contracts to run clinical trials. The principal investigator for the clinical trials contract is **Emmanuel "Chip" Walter, MD, HS'90**, a professor in the Department of Pediatrics at Duke University School of Medicine and chief medical officer of DHVI. This phase will test promising vaccines in small groups of healthy adult participants.

Under the leadership of Director Barton Haynes, MD, DHVI has led HIV vaccine development since 2005. In addition to researching HIV and influenza, investigators at the DHVI conduct basic and translational research to develop vaccines, therapeutics and diagnostics for tuberculosis, malaria, Ebola, cytomegalovirus and the zika flavivirus. They are currently working to develop both an antibody countermeasure and vaccine to combat COVID-19.



**Influenza infects millions of people around the world every year**

# Balancing Act

How the Section of Surgical Disciplines excels in both research and clinical care

When Shelley Hwang, MD, MPH, is in the operating room performing surgery on a patient with breast cancer, she focuses all of her considerable experience, skill, and knowledge on the task at hand: giving this individual patient the best possible outcome.

At the same time, she recognizes that every operation is an opportunity to learn just a little bit more about the disease she battles every day. Every patient and every procedure add to the store of knowledge that guides research and ultimately informs the advances that improve care.

“Surgeons are on the front lines against disease,” says Hwang, the Mary and Deryl Hart Distinguished Professor of Surgery and vice chair of research at Duke University School of Medicine. “Who is in a better position to understand the enemy? We are a clinical discipline, and clinical care is always going to be the most important thing we do: our first obligation is to the patients we have now. But we are also in a rare position to make a difference for all those patients we are never going to meet in person. We can contribute to patients’ health on an individual level, but we can also contribute to the knowledge base and improve human health worldwide. What an incredible privilege that

is. That’s the beauty of research.”

Duke University’s Section of Surgical Disciplines, which comprises the Department of Surgery and the Department of Head and Neck Surgery & Communication Sciences, achieves excellence both in providing first-rate clinical care and in conducting groundbreaking research at an exceptionally high level. Duke Surgery is ranked in the top four nationally in both the *U.S. News & World Report* overall rankings and in National Institutes of Health research funding. The section has ranked in the top five in NIH research funding for the last 11 fiscal years, reaching No. 1 in 2018, and Hwang was the nation’s top NIH-funded individual surgeon-scientist that year.

In addition to performing some 80,000 surgeries every year, the 326 faculty

members in the Section of Surgical Disciplines conduct over 400 clinical trials and publish more than 500 papers in peer-reviewed journals annually.

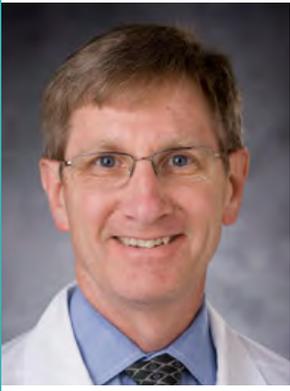
Very few academic surgical departments are able



Shelley Hwang

By Dave Hart \ Illustration by Joey Guidone





Allan Kirk



Kent Weinhold



Julie Thacker

**“We can contribute to patients’ health on an individual level, but we can also contribute to the knowledge base and improve human health worldwide. What an incredible privilege that is. That’s the beauty of research.”**

SHELLEY HWANG

to balance the demands of the operating room and the research lab at such high levels of achievement. At many institutions, time constraints, pressure to maintain high volumes of procedures, and funding limitations keep surgery and research all but mutually exclusive.

One key to balancing clinical care and research, says **Allan Kirk, MD'87, PhD'92, HS'95**, vice dean of the Section of Surgical Disciplines, is treating them not as two different missions, but as two aspects of the same one. At Duke, not only are surgery and research not mutually exclusive: they're mutually supportive. Surgical practice informs research, and research leads to innovations and improvements in surgical practice.

“Doing surgery gives you insights and data that inform your investigation as a researcher that you couldn't get otherwise,” says Kirk, the David C. Sabiston Jr. Distinguished Professor of Surgery. “We help our surgeons find areas of research that are facilitated by their surgical practice and patients. If you're a heart transplant surgeon and you're interested in heart transplant biology, your surgery gives you a leg up over researchers who can't do surgery. We look for areas of research where there's a synergy between clinical practice and discovery. Then your role as a surgeon is a competitive advantage, not an impediment.”

#### A CULTURE OF DISCOVERY

When Kirk came to Duke in 2014 from Emory University, one of the things that drew him here was the commitment within the School of Medicine and the university to excellence in research as well as clinical care. Essential to success is enthusiastic buy-in from university administration, School of Medicine **Dean Mary E. Klotman, BS'76, MD'80, HS'80-'83, HS'83-'85**, and departmental faculty.

“Everyone I spoke to, at every level, wanted surgeons to be a part of discovery,” says Kirk. “That is very rare. Most health centers see surgery as maybe financing the discovery mission, but not being an active part of it. At Duke, nobody thinks surgery should be anything other than an active part of discovery. The institution wants surgeons to be involved in discovery, and the surgeons want to be involved in discovery. Once you have that level of commitment, it's just a matter of logistically making it work.”

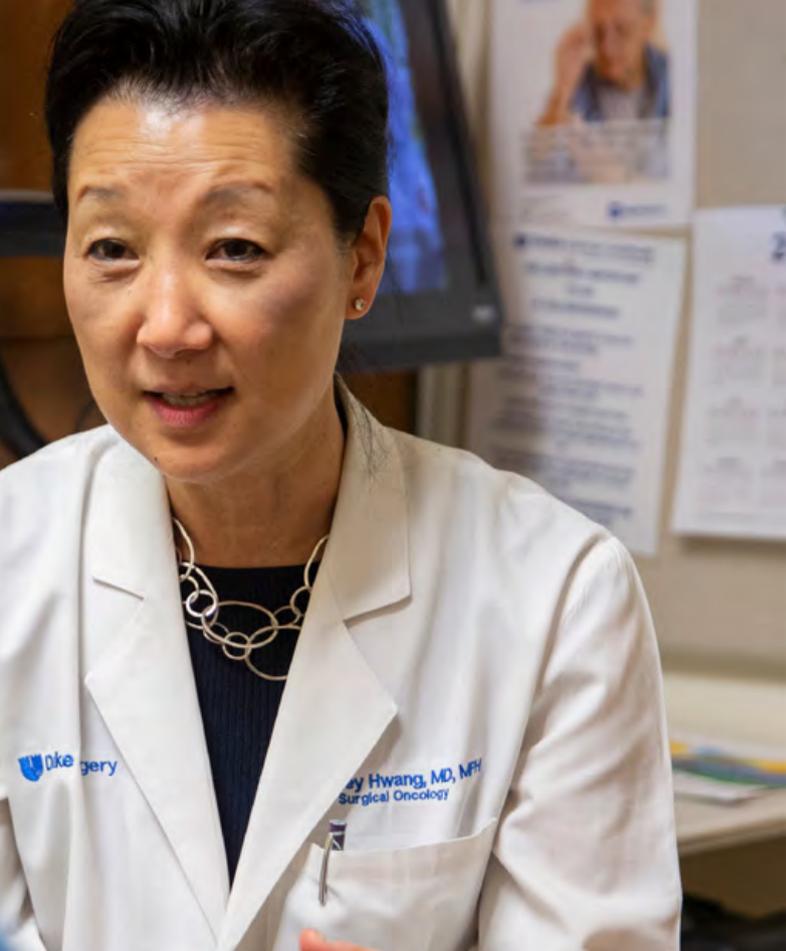
The department has created an impressive infrastructure to support the entire research spectrum, from basic science to clinical implementation and everything in between. Kent Weinhold, PhD, is chief of the Division of Surgical Sciences, a unique division where basic and translational scientists work on everything from molecular

immunology to gene therapy to wound healing. The Surgery Office of Clinical Research, under Julie Thacker, MD, coordinates clinical research aimed at improving patient safety and therapeutic effectiveness. The Surgical Center for Outcomes Research, led by **Chuck Scales, MD'04, HS '05-'11**, is a health service research unit that uses various methodologies to assess factors that affect surgical outcomes. Shared resources such as the Substrate Services Core Research Support serve as biorepositories for data and sample storage and analysis, saving money and achieving efficiencies of scale.

Weinhold, the Joseph W. and Dorothy W. Beard Distinguished Professor of Experimental Surgery, says the Division of Surgical Sciences—and, indeed, the entire culture of discovery in the Division of Surgical Sciences—is a legacy of David Sabiston, MD, the legendary chair of surgery from 1964 to 1994, and his predecessor, Deryl Hart, MD.

Hart established the Division of Experimental Surgery, the forerunner of the Surgical Sciences Division, and Sabiston made basic science a fundamental component of the department's mission, integrating discovery and patient care and requiring that surgical residents spend 2-3 years doing basic research.

“Dr. Sabiston believed an academic surgeon should be one who is not only extraordinarily gifted in the operating room, but one who is equally gifted at doing hypothesis-driven research and moving the field forward,” says Weinhold, whom Sabiston recruited in 1980. “He recruited a number of outstanding basic scientists and entrenched them with the clinical faculty to encourage new ideas and collaborations. And that's still the ethos here. I don't think I've ever approached a clinician here with an idea for a project and had them say no. It's always, ‘That sounds interesting. Let's give it a try.’”



SHAWN ROCCO

**1KP**

Among the most innovative and far-reaching research programs launched within the Section of Surgical Disciplines is the 1000 Patient Project, known informally as “1KP.”

The 1000 Patient Project is based on the premise that surgery is, in essence, a planned, highly controlled form of injury—and therefore an opportunity to study injury and recovery.

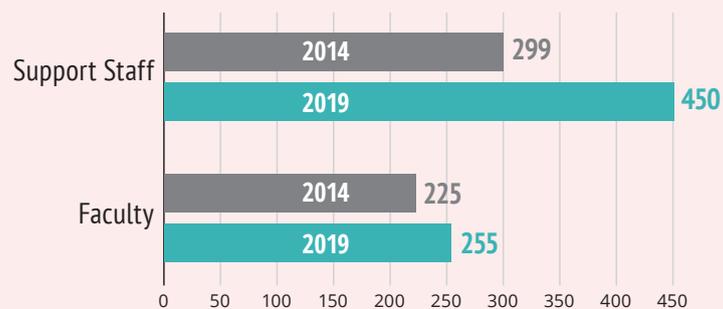
Dozens of Duke surgeons work together with the 1KP research team to gather detailed physiological, demo-graphic, genetic, immunological, and other data from patients undergoing any one of 12 different types of surgery. This wealth of information offers unprecedented insights into a vast range of questions: How do various systems and processes react to trauma? What constitutes resilience? What factors impede recovery, or improve it?

“Our bodies constantly work hard to maintain homeostasis,” says Hwang. “This gives us a chance to look deeply at what happens when we perturb that process. What happens to their genes? What happens with their stress proteins or immune system? Are we altering their biome, and how does that influence recovery? How do all these systems work to return to homeostasis?”

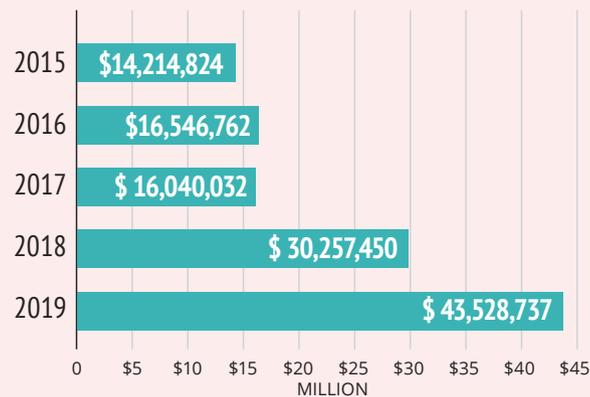
Those answers, in turn, can lead to new therapies and new approaches.

“We want to use this data to identify biomarkers that will help us predict how well individual patients will do, and to develop interventions to increase resilience and recovery,” says Hwang. “This is our big departmental science project. It’s touched pretty much every surgeon in our departments in some way, and we are grateful to the hundreds of enthusiastic patients who have volunteered critical samples and time to this effort.”

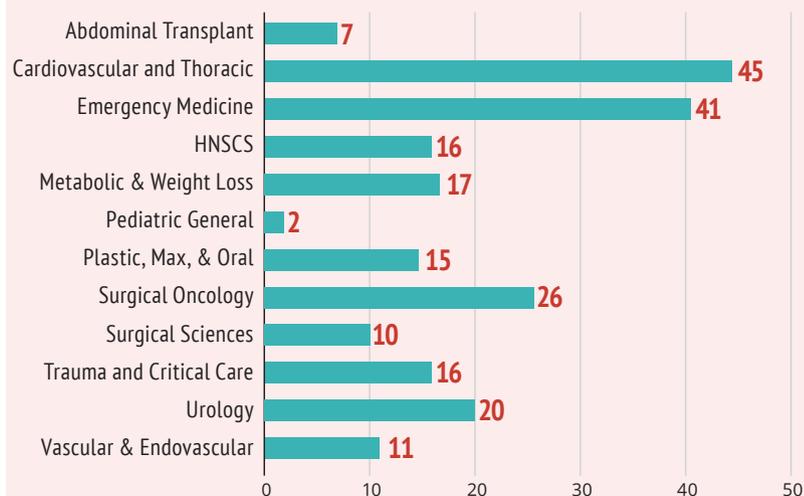
**SECTION OF SURGICAL DISCIPLINES GROWTH**



**NIH FUNDING GROWTH**



**CLINICAL HIRES BY DIVISION SINCE 2014**





David C. Sabiston Jr.

The section has created infrastructure to store and sort the huge amount of data generated by the 1000 Patient Project. Researchers are tapping that data for myriad projects.

“Side projects are firing out all over the place,” says Kirk. “The 1000 Patient Project has already gotten a lot of translational and clinical research projects off the ground. It also has given the whole department a project it could work on collectively, and that has helped discovery permeate into a lot of new areas.”

### A BLACK BOX FOR THE OR

The flip side of 1KP is a new project the section calls the “OR Black Box.” The idea, pioneered by Theodore Grancharov, MD, at St. Michael’s Hospital on Toronto, is based on the ubiquitous “black box” systems that record flight data during every commercial airline trip. If a plane has a problem, investigators can analyze the data stored on the black box to determine what went wrong.

In the operating room, the Black Box system will place audio and video recorders to capture the activity during each operation. Correlating that activity with outcomes will guide improvements in surgical efficiency, patient safety, and results.

While the 1000 Patient Project gathers data on the physiological factors that affect recovery, the Black Box project will provide insights into external factors that may influence outcomes—some of them not immediately obvious.

“The Black Box is going to tell us a great deal,” says Julie Thacker, medical director of the Clinical Research Unit, which is overseeing the project. “How many times does the door open and close? How many times was the surgeon interrupted? Does a procedure get delayed if someone has to leave the room to get an instrument? Do these things tend to happen at certain times of day? Are the interactions among the surgical team efficient and natural, or tense and difficult? And so on. All of these things can potentially affect outcomes.”

For example, a 2015 study at Johns Hopkins found that operating room doors opened an average of once every two and a half minutes during surgery. Every time that happens, air flow and pressure can change and contaminated air from outside has the potential to enter the room, possibly affecting rates of infection.

Another facet of the Black Box program involves in-device cameras that record robotic laparoscopic surgeries.

**“He recruited a number of outstanding basic scientists and entrenched them with the clinical faculty to encourage new ideas and collaborations. And that’s still the ethos here.”**

### KENT WEINHOLD

researchers to collect vast amounts of data, fueling discovery at every level, from molecular genetics to population health.

Discovery is expensive. Federal funding, of course, is essential, but Kirk says philanthropy plays an increasingly important role as well.

“Doing anything well costs money,” he says. “Doing it poorly costs more. We have made great strides toward building the best academic Section of Surgical Disciplines that we can. As margins decrease, we are going to become increasingly dependent on philanthropy to continue this work.”

And as they do, Kirk says, they keep one person always in mind.

“We capture huge amounts of data, and we explore all kinds of questions, but all of it links back to the people we treat,” he says. “The key factor is to keep the patient at the center of everything we do.”

“The point is to examine how we do things and look for ways to do them better,” says Thacker. “We have great doctors and nurses. But until somebody comes up with a way to do perfectly painless, perfectly non-intrusive operations, there is always room for improvement.”

### HOLDING DISEASE IN THEIR HANDS

As Dr. Sabiston recognized half a century ago, few people are more intimately familiar with disease than surgeons, and that gives them a special responsibility to explore it. The philosophy of discovery he instilled continues to drive the department.

“To surgeons, disease is not an abstract concept,” Kirk says. “It’s something we are literally immersed in. We hold it in our hands. And that tactile immediacy gives you the desire to understand disease at a deeper level, to learn things that you can use to improve care.”

The surgeons at Duke are engaged in that work on countless fronts.

Technology has enabled clinicians and researchers to collect vast amounts of data, fueling discovery at every level, from molecular genetics to population health.



## New Company to Accelerate Duke's Drug Discovery

Duke University and Deerfield Management Company, a health care investment firm, announced a major translational research collaboration in late 2019. Spearheaded by Duke University's Office of Licensing & Ventures (OLV), the alliance is expected to accelerate Duke's preclinical development of new drugs.

Through a newly launched company called Four Points Innovation, up to \$130 million of initial funding will be made available by Deerfield to back the initiative for 10 years. Four Points Innovation will support Duke R&D projects throughout preclinical stages of drug discovery and development. Project proposals by Duke researchers will be considered by a committee comprising scientific leadership representing Duke and Deerfield.

Accepted projects will include a development plan aimed at achieving investigational new drug readiness. Deerfield will provide funding and operational support for accepted projects.

Duke's OLV broke records last year with 354 invention disclosures, 120 agreements, and 32 exclusive agreements. Duke faculty and staff formed 16 new start-up companies, bringing the university's total to more than 140 new companies.

## DUKE SURGEONS PERFORM FIRST DCD HEART TRANSPLANT

A heart transplant team at Duke University Hospital became the first in the U.S. to transplant an adult heart into a recipient through a process known as Donation after Circulatory Death, or DCD.

Duke is one of five centers in the United States that has been approved to perform DCD heart transplants as part of a recently launched clinical trial of a device to circulate warm, oxygenated blood through organs.

Traditionally, heart donations have depended on a declaration of brain death. Donation after circulatory death occurs after the heart has stopped beating and the person's death has been declared.

The procedure could expand the donor pool by up to 30 percent, decreasing wait time and deaths that occur while people are waiting,



SHAWN ROCCO

said **Jacob Schroder, MD, HS'01, HS'12**, who performed the procedure at Duke in early December 2019 and is surgical director of Duke's Heart Transplant Program in the Department of Surgery.

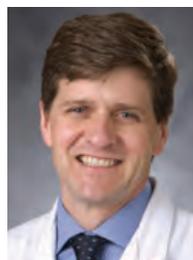
## NIH Renews Funding for Antibacterial Resistance Group

The National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, will provide up to \$102.5 million in renewed funding over seven years for the Antibacterial Resistance Leadership Group (ARLG), coordinated by the Duke Clinical Research Institute (DCRI).

This global consortium of scientific experts leads a comprehensive clinical research network overseeing research related to antibacterial resistance. The renewed funding from NIAID will provide DCRI with support to continue and enhance the ARLG's research activities.

Under the new grant, the ARLG will place a renewed emphasis on the development of better countermeasures against antibiotic-resistant bacteria. The ARLG also will support improved diagnostic tests for identifying antibiotic-resistant microbes and provide support for research on optimizing the use of existing antibiotics.

**Vance Fowler, AB'88, MD, HS'93-'96, HS'96-'99**, of Duke and Henry Chambers, MD, of the University of California, San Francisco, are the ARLG principal investigators.



Vance Fowler

## RADIOLOGY PROGRAM NAMED BEST IN NATION

The residency program in the Department of Radiology at Duke University School of Medicine has been named the Best Radiologist Training Program in the country as part of the 20th annual Minnies awards.

For two decades, the annual Minnies awards have served as a barometer of excellence in radiology. Novel aspects about the Department of Radiology's residency program that stood out include a curriculum that has been adapted to emphasize sub-specialization, with all residents guaranteed a fellowship.

The flexibility of the residents' fourth year also stood out. Some residents use the year for research, while others participate in mini-fellowships, spending six months in a particular area that is distinct from their primary fellowship, essentially meaning that some residents have completed a dual fellowship by the time they graduate.

## New Center Takes Aim at the Dark Genome

Duke University engineers, scientists, and physicians are joining forces to develop technologies to understand the genetic webs underpinning many diseases and unearth new drug targets and gene therapies to fight them.

The new Duke Center for Advanced Genomic Technologies (CAGT) will probe the human genome, with a particular focus on the so-called "dark genome"—non-protein-coding DNA thought to hold the keys to treating common, complex disorders such as cancer and neurological disease.

The CAGT will be directed by Charlie Gersbach, PhD, a leader in the development of CRISPR-based technologies. Gersbach is the Rooney Family Associate Professor of Biomedical Engineering and associate professor in surgery.

## SOM AGAIN RANKED AMONG NATION'S BEST

Graduate program rankings released by *U.S. News & World Report* in March 2020 place Duke University School of Medicine among the top in the nation.

The School of Medicine was ranked among the best in the nation, placing 12th among 120 schools. Seven specialty programs in the School of Medicine ranked in the top 10:

**Surgery (fourth);  
Anesthesiology (fourth);  
Internal Medicine (fifth);  
Radiology (tied, fifth);  
Obstetrics and Gynecology  
(tied, fifth);  
Pediatrics (tied, ninth); and  
Psychiatry (tied, tenth).**

The medical school's Physical Therapy program ranked No. 7 among 244 programs evaluated.

"Our stature as one of the nation's preeminent medical schools is a direct reflection of

**"I am especially proud of our departments, which consistently rank in the top among their peers each year..."**

MARY E. KLOTMAN

our exceptional faculty, students, and staff who consistently raise the bar for medical research, education, and patient care," said **Mary E. Klotman, BS'76, MD'80, HS'80-'83, HS'83-'85**, dean of Duke University School of Medicine. "I am especially proud of our departments, which consistently rank in the top among their peers each year, and of our Doctor of Physical Therapy program, which rose to number 7 in the rankings."

The magazine uses criteria such as grade-point averages of incoming students, acceptance rates, and employment outcomes of graduates. For medical schools, the magazine also weighs NIH funding, NIH funding per faculty member, medical school entrance scores, and grade point averages, among other criteria.

# Kaelin Wins Nobel Prize

**William G. Kaelin Jr., BS'79, MD'83**, a Duke trustee and alumnus, was awarded the 2019 Nobel Prize for Physiology or Medicine.

Kaelin is the Sidney Farber Professor of Medicine at Dana-Farber Cancer Institute and Brigham & Women's Hospital, Harvard Medical School, and a Howard Hughes Medical Institute investigator.

Kaelin shared the prize with Sir Peter Ratcliffe, FRS, FMedSci, of Oxford University and **Gregg Semenza, MD, PhD, HS'84-'86**, of



William G. Kaelin Jr.

Johns Hopkins University for research on how cells sense and adapt to oxygen availability, a process that is essential for survival of any organism and a part of cancer resistance. The work has implications for diseases beyond cancer, such as anemia, myocardial infarction, and stroke.

The three researchers had previously shared the Albert Lasker Basic Medical Research Award in 2016.

"I am delighted to join the chorus of colleagues and friends in congratulating Bill Kaelin on this extraordinary and well-deserved honor," said Duke President Vincent Price. "Bill's groundbreaking work in genetics and

physiology is transforming our understanding of how the body fights disease, and it has the potential to save so many lives in the years ahead. Our entire university community is very proud of him as a double Duke alumnus, trustee, and honorary degree recipient."

"This enormous honor serves as a symbol of Dr. Kaelin's seminal discoveries, which are advancing the frontiers of science, addressing some of society's most pressing health challenges, and improving the lives of people around the world," said A. Eugene Washington, MD, chancellor for Health Affairs for Duke and president and CEO of Duke University Health System.

Kaelin earned his undergraduate degree in 1979, majoring in chemistry and mathematics, and a medical degree from Duke in 1983. He received an honorary degree from Duke in 2018 and the Duke University School of Medicine Distinguished Alumni Award in 2007.

He joined the Duke Board of Trustees in July 2019.

"This is well-deserved recognition for such an impactful body of work," said **Mary E. Klotman, BS'76, MD'80, HS'80-'83, HS'83-'85**, dean of the Duke University School of Medicine. "We are so very proud of our Duke Med alum."

Kaelin is a member of the American Society of Clinical Investigation, the American College of Physicians, the National Academy of Sciences, and the National Academy of Medicine.

He is the third Duke alumnus to receive the Nobel Prize. Previous alumni winners were Robert Richardson and Charles Townes. Two current School of Medicine faculty members, Robert Lefkowitz and Paul Modrich, have received the Nobel Prize in Chemistry.

Kaelin wasn't the only Duke connection among the winners. Gregg Semenza did training in pediatrics at Duke from 1984-86.

## NIH TAPS DUKE TO ADDRESS OPIOID CRISIS

Research teams from Duke received more than \$24 million in federal grants to address challenges related to pain and the opioid crisis, with more than \$19 million awarded to investigators from the Duke Clinical Research Institute (DCRI), the world's largest academic research organization.

The grants are part of the NIH's Helping to End Addiction Long-term Initiative. The initiative aims

to apply scientific solutions to improve treatments for chronic pain, curb rates of opioid use disorder and overdose, and achieve long-term recovery.

The Duke research awards provide support for a clinical center to conduct Phase 2 trials of non-addictive pain interventions; a research project to identify new central analgesic circuits that could be harnessed to treat chronic pain; and a research program to improve the efficacy of using an implantable medical device that stimulates the spinal cord to treat chronic neuropathic pain.



JIM ROGALSKI

The Duke Health Development and Alumni Affairs team was honored for its resilience after a gas explosion damaged its offices in April 2019.

## DHDAA AMONG PRESIDENTIAL AWARD HONOREES

The 105 members of the Duke Health Development and Alumni Affairs (DHDAA) team were among the recipients of the 2019 Presidential Awards, honored for the “bravery, camaraderie, endurance, innovation, and resilience” they displayed in the aftermath of a gas explosion on April 10, 2019, that damaged their offices and injured nearly two dozen DHDAA staff.

The Presidential Awards recognize individuals and teams who made distinctive contributions to Duke University and Health System and have demonstrated its institutional values of respect, trust, inclusion, diversity, and excellence during the 2018-19 academic year. The awards are the highest honor given by Duke to staff and faculty members.

DHDAA team members were at their desks when the explosion occurred. In the chaotic moments immediately afterward, team members helped each other out of the damaged building to safety and, after ensuring that everyone was out, tended to their injured co-workers. The building was too badly damaged to return to, and DHDAA had to quickly adapt to working remotely from various locations.

Other Presidential Award winners within Duke University School of Medicine and Duke University Health System included:

### CODE BLUE FIRST RESPONDERS AT DUKE UNIVERSITY HOSPITAL

On October 15, 2018, Betsy Hames, Duke University School of Medicine associate dean and chief human resources officer, went into sudden cardiac arrest while working at her desk. Within moments, co-workers summoned help and started working to resuscitate her. With help from 16 employees, Hames’ co-workers who led the way for help to arrive, and first responders who administered vital care, Hames’ life was saved.

### ADVANCED PRACTICE PROVIDERS OF THE BREAST SURGICAL ONCOLOGY TEAM

In addition to being compassionate guides for patients undergoing care for breast cancer, the nine women on this team have worked to make Duke’s care more efficient and effective. By constantly looking out for the needs of the patients and spearheading outreach efforts, the group has become an integral part of Duke’s cancer care.



CHRIS HILDRETH

A group of Duke employees was honored for coming to the rescue of a co-worker who suffered cardiac arrest.

### NICOLE HEILBRON, ASSOCIATE PROFESSOR, DUKE PSYCHIATRY & BEHAVIORAL SCIENCES

With an ability to draw the best out of her colleagues, **Heilbron, PhD, HS’07**, has become one of her department’s most admired leaders. She has also re-envisioned the clinical services the department offers, bringing about changes that better serve the needs of patients.

### PETER KUSSIN, PROFESSOR OF MEDICINE, DUKE GLOBAL HEALTH INSTITUTE

During his 34-year career, **Kussin MD, HS’85-’89**, has treated some of Duke University Hospital’s most difficult cases and provided care for patients in Southeast Asia following a tsunami, Mississippi following Hurricane Katrina, and rural Kenya, where he spends four months each year.

### WILBERT MOORE, SURGICAL ATTENDANT, DUKE RALEIGH HOSPITAL

Moore plays a vital role in the surgical operations at Duke Raleigh Hospital, protecting patients, nurses, and physicians by caring for the surgical facilities and equipment. By serving as a valuable resource for new employees and an adept trouble-shooter, Moore is a key piece of the Duke Raleigh team.

The winners were honored at an awards ceremony on February 25, 2020, in Page Auditorium.



BOB LEVERONE

# Giving Back and Paying Forward

Susan and Tom Rainey, with Morgan

“We feel tremendous loyalty, and we want to do what we can to both give back and pay forward.”

TOM RAINEY

**Tom Rainey, AB’70, MD’74, P’04, P’07,** and **Susan Rainey, BSN’70, P’04, P’07,** met during their first week on campus at Duke. “We dated through college, broke up forever once or twice, and then got married in Duke Chapel after my first year of medical school,” recalls Tom.

Duke shaped their lives professionally as well as personally. The School of Medicine instilled in Tom the primacy of the patient and prepared him for a successful career

in intensive care medicine and leadership; he is currently president, CEO, and founder of CriticalMed, Inc. The School of Nursing set Susan on her career as a clinical nurse, instructor, and administrator at Duke and George Washington University.

The Rainey’s have remained active with Duke and their respective alumni groups—Tom is the current vice president of the Duke Medical Alumni Council—and are generous donors. They recently established endowed scholarships in both the School of Medicine and the School of Nursing.

“In many ways, we are the people we are today because of Duke,” says Tom. “We feel tremendous loyalty, and we want to do what we can to both give back and pay forward.”

Gifts for medical education that help prepare the next generation of great physician leaders are just one of many ways you can support Duke University School of Medicine. Please consider making a gift online at [gifts.duke.edu/dmaa](https://gifts.duke.edu/dmaa).

To learn more about how to support the School of Medicine, please contact Sarah Nicholson, assistant vice president, at [sarah.nicholson@duke.edu](mailto:sarah.nicholson@duke.edu).

## DAA Honors SOM Faculty, Alumni

Two Duke University School of Medicine faculty and four School of Medicine alumni were honored with 2019 Duke Alumni Association Awards.

**Blake Wilson, BSE'74, PhD'15**, an adjunct professor in the Department of Surgery, was presented with the Distinguished Alumni Award, the university's highest alumni honor. The award is presented to alumni who have made outstanding contributions to Duke and toward the betterment of humanity through their field of work. Wilson is credited with inventing many of the sound-processing capabilities of the modern cochlear implant, which allows individuals with profound deafness to hear.

Leonard White, PhD, associate professor in neurology and associate director of the Duke Institute for Brain Sciences, received the Alumni Distinguished Undergraduate Teaching Award, a student-selected award sponsored by the Alumni Association for a Duke professor who has excelled as a teacher, advisor, and leader of undergraduate students.



Blake Wilson



Leonard White



Stephen Cochi

**William Andrews, AB'76, MD'80, HS'82-'86, P'06**, and **Katherine Upchurch, MD'76, P'10**, were honored with the Charles A. Dukes Award for Outstanding Volunteer Service. The award recognizes alumni volunteers who serve in Duke leadership roles and who have devoted themselves to extraordinary long-term efforts that help Duke further its mission.

**Stephen Cochi, MD'77, HS'77**, received a Beyond Duke Service and Leadership Award. This award, inaugurated in 2014, recognizes alumni who have distinguished themselves through service to their community, to their country, or to society at large.

**Oren Mushin, MD'11**, received a Forever Duke Award, which recognizes alumni for excellent recent volunteer service to Duke, the Duke Alumni Association, and other alumni groups.



Oren Mushin and William Andrews



Associate Vice President for Alumni Affairs Sterly Wilder and Katherine Upchurch



The portrait of **Brenda Armstrong** is now hanging in the Trent Semans Center for Health Education.

## PORTRAIT OF A PIONEER

A. Eugene Washington, MD, chancellor of the Duke University Health System, and Duke University School of Medicine Dean **Mary E. Klotman, BS'76, MD'80, HS'80-'83, HS'83-'85** unveil a portrait of the late **Brenda Armstrong, AB'70, MD, HS'75-'79**, a Duke pioneer who was among the first African American undergraduates at Duke and who went on to become one of the most influential contributors in expanding the diversity of the American physician workforce. Armstrong died in 2018.

A professor of pediatrics, Armstrong was associate dean for admissions and senior associate dean for student diversity, recruitment, and retention at the School of Medicine for more than two decades. In September 2019, she was posthumously awarded the University Medal, Duke's highest honor.

CHRIS HILDRETH



Above, student Karen Monuszko, MSIII, explains her poster to judges. Right, Colin Duckett; Lefkowitz Lecture Award winner Karl Deisseroth, MD, PhD; Dean Klotman; and Robert J. Lefkowitz



## INAUGURAL RESEARCH WEEK DRAWS HUNDREDS

Hundreds of faculty, trainees, students, and staff attended the School of Medicine's inaugural Research Week, held October 14-17, 2019. The week-long event included lectures, a poster session, an Innovation Jam sponsored by the Duke Institute for Health Innovation, and a Town Hall hosted by the Office of Scientific Integrity.

During Innovation Jam, faculty members and students gave timed presentations to investors about

**"It provided a week-long celebration of research, illustrating the importance of discovery and innovation and highlighting the outstanding work of our faculty, trainees, and students."**

DEAN **MARY E. KLOTMAN**

their most innovative health care ideas—including devices, diagnostics, and digital therapeutics—that could have immediate application at Duke or commercialization elsewhere.

"I am thrilled with the success of the first-ever School of Medicine Research Week," said Dean **Mary E. Klotman, BS'76, MD'80, HS'80-'83, HS'83-'85**. "It provided a week-long celebration of research, illustrating the importance of discovery and innovation and highlighting the outstanding work of our faculty, trainees, and students."

Fifty graduate students, clinical trainees, and medical students presented research posters during the poster session.

## SOM Faculty Recognized on Highly Cited List

Fifty-four members of Duke's faculty are included in the 2019 Highly Cited Researchers list compiled by ISI-Web of Science and Clarivate Analytics. More than half (37) are from the School of Medicine.

A high citation rate is an indication that a researcher's work is influential in his or her field. Globally, Duke tied for eighth place on the list along with the Massachusetts Institute of Technology, Memorial Sloan Kettering Cancer Center, and the University of California San Diego.

The data are taken from 21 broad research fields. The fields are defined by sets of journals and, in the case of multidisciplinary journals such as *Nature* and *Science*, by a paper-by-paper assignment to a field based on an analysis of the cited references in the papers.

The full list is available at [bit.ly/DMAN-highlycited](https://bit.ly/DMAN-highlycited).

## ARCHIVES ACQUIRE PAPERS OF DUKE'S FIRST AFRICAN AMERICAN SURGEON

The Duke University Medical Center Archives recently acquired the Onyekwere E. Akwari Papers, which document the life and career of Onyekwere E. Akwari, MD, the first African American surgeon at Duke University, who passed away last year. (See *Obituary*, page 45.) Akwari's wife, Anne Akwari, donated the collection.

Akwari immigrated to the United States from Nigeria in 1962. The late David C. Sabiston Jr., MD, then chair of the Department of Surgery at Duke, recruited him as an associate professor of surgery after Akwari's training at the Mayo Clinic. At the

time, Duke University Medical Center only had two other African American professors on faculty, and Akwari was only the second on the academic tenure track.

The Onyekwere E. Akwari Papers include extensive research publications, medical documents, surgical slides, correspondence, family papers, photographs, and other records. The collection should be of note to researchers interested in studying the development of surgical medicine and diversity efforts at Duke, as well as the history of African Americans in the United States medical field.

## ADHD LINKED TO NICOTINE ADDICTION RISK

People with attention deficit hyperactivity disorder (ADHD) are more likely to self-administer nicotine and report more pleasurable responses than people without the condition, according to a study by Duke Health researchers.

In a paper published in *Neuropsychopharmacology*, Duke researchers exposed non-smoking young adult participants—about half of whom had a clinical diagnosis of ADHD—to doses of a nicotine nasal spray and a placebo spray without nicotine. Later they asked participants to choose one spray or the other, first in a relaxed environment and then while solving math problems. The participants did not know which spray contained nicotine.

Regardless of demand conditions, the people with ADHD chose the nicotine, said lead author **Scott Kollins, AB'92, PhD**, professor in the Department of Psychiatry and Behavioral Sciences. The people without ADHD chose nicotine more often when they had to concentrate on the math problems.

The results emphasize the importance of talking to children and adolescents with ADHD about the effects of nicotine and their potential risk for becoming addicted, Kollins said.

## IMMUNE SYSTEM CAN BE COAXED INTO FIGHTING HIV

Duke researchers have shown in animal models that effective, yet short-lasting antibodies can be coaxed into multiplying as a fighting force against HIV.

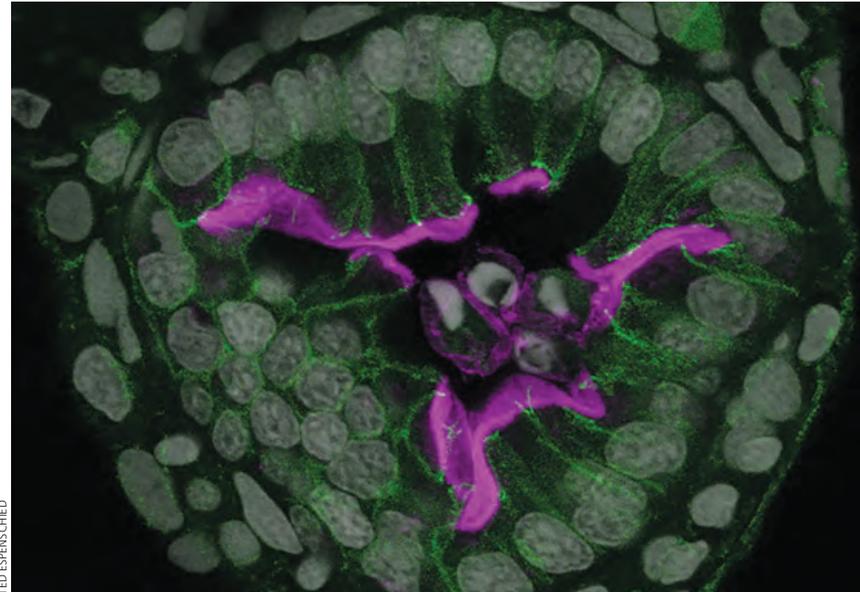
Efforts to develop an HIV vaccine center on inducing the body to produce broadly neutralizing antibodies (bnAbs), which neutralize HIV infections. Among the obstacles are the immune system itself, which identifies some bnAbs as a danger and shuts down their production, and the rare mutations that the antibodies require in order to be effective.

Researchers at the Duke Human Vaccine Institute (DHVI) and Boston Children's Hospital succeeded in developing immunogens that could coax cells to undergo the improbable mutations that result in broadly neutralizing antibodies.

The study is proof of concept that researchers can engineer the immune system to create an environment where the right antibodies

can be made, said co-senior author **Barton F. Haynes, MD, HS'73-'75**, director of DHVI. Insights gained from the research have direct implications not only for HIV, but also for cancer immunotherapies and treatments for autoimmune disorders.

The behavior of gut cells in zebrafish may have implications for human cancer therapies.



## Researchers Find More Effective Cancer Vaccine Approach

Using a precursor to dendritic cells appears to be an efficient and effective way to stimulate the immune system to fight cancer tumors, according to a study in animal and cell models by researchers at the Duke Cancer Institute.

The finding, described online in the *Journal of Clinical Investigation*, provides an alternative to dendritic cell cancer vaccines, which have shown promise as a way to prompt T-cells to recognize and attack cancer cells, but have had limited success improving patient survival.

The new approach uses monocytes, a type of white blood cell that is a forerunner of dendritic cells. When the researchers, led by senior author Michael D. Gunn, MD, professor in the departments of medicine and immunology at Duke University School of Medicine, loaded the monocytes with an antigen and injected them in mice, they indirectly induced a T-cell response that attacked tumors.

## GUT JETTISONS CELLS WHEN TOXINS BUILD UP

A team of Duke researchers has discovered that cells lining the gut of zebrafish—and probably humans too—have a remarkable defense mech-

anism that ejects toxins.

The Duke team led by **Ted Espenschied, PhD'19**, was testing more than 20 non-steroidal anti-inflammatory drugs (NSAIDs) in an attempt to make the zebrafish a new model for studying chemical injury in the gut.

The researchers found something unexpected. An old NSAID called Glafenine made the fish shed up to a quarter of the cells lining their intestines by a process called delamination. They found that delamination is actually a highly effective defense strategy in which gut epithelial cells push out cells that are distressed.

Espenschied determined that Glafenine's relevant trait was its ability to inhibit a cellular structure called the multidrug-resistant, or MDR, efflux pump, which helps purge unwelcome chemicals.

Cancer researchers are interested in finding ways to block MDR efflux pumps because they can push chemotherapies out of cancer cells, foiling cancer therapy.

# AN INVESTMENT IN EXCELLENCE

“I hope I help in some small way to support that. It’s a team effort.”

C. Keith Ozaki

**C. Keith Ozaki, AB’84, MD’88**, majored in political science as an undergraduate at Duke, but he soon found himself drawn toward the life sciences. “I felt like we were studying the real world, as opposed to the man-made world of politics and policy,” says Ozaki, the John A. Mannick Professor of Surgery and vice-chair of the Department of Surgery at Brigham and Women’s Hospital/Harvard Medical School. “Pretty early on, I decided I wanted to explore science and medicine.”

His experience at the School of Medicine confirmed that decision. Learning and working alongside fellow students, residents, and influential faculty like vascular surgeon Richard McCann, MD, prepared him for a residency and fellowship at Harvard and then a successful career at Michigan, the University of Florida, and, for the past 12 years, back in Boston.

“Duke was transformative for me, and I am forever grateful,” says Ozaki.

Ozaki hosts an annual welcome reception for School of Medicine graduates starting their careers in Boston, and he is a longtime supporter of the Davison Club.

“The return on investment of philanthropy to Duke, in terms of the quality of education and experience that students get, is unsurpassed,” says Ozaki. “I hope I help in some small way to support that. It’s a team effort.”

Gifts to the Davison Club provide critical unrestricted support for medical education through scholarships, curriculum enhancements, new technologies, and innovative research. Please consider making a gift online at [gifts.duke.edu/dmaa](https://gifts.duke.edu/dmaa).

To learn more about supporting the Davison Club, please contact Jill Malley at [jill.malley@duke.edu](mailto:jill.malley@duke.edu).



Donald McDonnell



Luigi Racioppi

## RESEARCHERS IDENTIFY ENZYME THAT SUPPRESSES IMMUNE RESPONSE TO BREAST CANCER

Duke Cancer Institute researchers have outlined a potential way to improve immunotherapy effectiveness by unclocking breast cancer tumors to the body's immune system.

Publishing in the journal *Nature Communications*, the researchers identified an enzyme in cells involved in regulating the growth and spread of breast cancers. Testing in mice, they demonstrated a way to shut down the enzyme's activity to allow T-cells to mount an immune attack.

Donald McDonnell, PhD, chair of Duke's Department of Pharmacology & Cancer Biology, and colleagues, including lead author and collaborator Luigi Racioppi, MD, PhD, identified a kinase called CaMKK2 as a potential therapeutic target for breast cancer. Working with colleagues at the University of North Carolina at Chapel Hill, they developed a new class of drugs that inhibited the growth of human breast tumors grown in mice.

McDonnell said additional studies are ongoing, with the goal of acquiring data to launch a clinical trial in breast cancer patients within the next 18 months.

## Kidney Donor's HIV Strain Found in Recipient After Transplant

A team of researchers from the Division of Infectious Diseases in the Department of Medicine at Duke University has described how a specific HIV strain from a deceased, HIV-positive kidney donor was present in renal cells sloughed from the organ and was detected in a transplant recipient, a 61-year-old, HIV-positive patient with polycystic kidney disease.

The new strain, however, was no longer detected in the recipient after 16 days, consistent with successful control by the antiretroviral therapy the patient was receiving.

In a letter to the *New England Journal of Medicine*, the team, led by **Mary E. Klotman, BS'76, MD'80, HS'80-'83, HS'83-'85**, dean of Duke University School of Medicine, performed in-depth viral sequence analyses on biological samples from both the recipient and donor during the peritransplant period to determine the presence of the strain.

The team found HIV infection of cells intrinsic to the kidney in both the donor and recipient, suggesting that the kidney might serve as a reservoir for the virus, said lead author Maria Blasi, PhD, assistant professor of medicine at Duke University School of Medicine.



Human joint cartilage can repair itself through a process similar to the one that helps salamanders regrow severed limbs.

## HUMANS HAVE A SALAMANDER-LIKE ABILITY TO REGROW CARTILAGE

Cartilage in human joints can repair itself through a process similar to that used by creatures such as salamanders to regenerate limbs, researchers at Duke Health have found.

Publishing online in *Science Advances*, the researchers identified a mechanism for cartilage repair that appears to be more robust in ankle joints and less so in hips. The finding could potentially lead to treatments for osteoarthritis.

Senior author **Virginia Byers Kraus, MD'83, PhD'93, HS'83-'89**, a professor in the departments of medicine, pathology, and Orthopaedic Surgery at Duke, and colleagues devised a way to determine the age of proteins

and found that the age of cartilage largely depends on where it resides in the body: young in ankles, middle-aged in knees, old in hips. This correlation aligns with how limb repair occurs in certain animals, which more readily regenerate at the furthest tips.

The researchers learned that molecules called microRNA regulate this process. These microRNAs are more active in animals that are known for limb, fin, or tail repair, but they are also found in humans—an evolutionary artifact that provides the capability in humans for joint tissue repair.

## Cardiac Arrests in Latino Neighborhoods Less Likely to Get CPR From Bystanders

People in predominantly Hispanic neighborhoods were less likely to receive CPR from bystanders, according to a new study by Duke University School of Medicine researchers published in the journal *Circulation*.

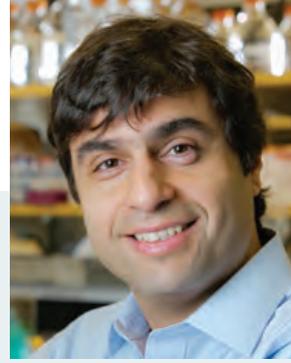
The study, led by Audrey Blewer, PhD, an assistant professor in the Department of Family Medicine & Community Health, analyzed sudden cardiac arrest survival data from the Resuscitation Outcomes Consortium, in which 27,482 arrest events were recorded from 2011-2015.

Blewer said that identifying these disparities highlights an important public health problem and should prompt discussion about ways to promote CPR training and bystander recognition of sudden cardiac arrest in these communities.

## PEOPLE



Erich Huang



Hashim Al-Hashimi



Mark Oldham

### HUANG IS DUKE FORGE'S NEW DIRECTOR

**Erich Huang, MD'03, PhD'02, HS'03-'08**, has been named director of Duke Forge and chief data officer for quality for the Duke University Health System.

Huang has served as co-director of Duke Forge since its inception in 2017. Duke Forge is located in the School of Medicine and serves as the center for actionable health data science, uniting experts from across the campus. Huang also serves as director of Duke Crucible and assistant dean for biomedical informatics in the School of Medicine.

As a physician-scientist, Huang is a critical addition to the Health System's Quality System. Under his leadership, the Health System will use data science to advance the ambitious agenda of "perfect patient care," moving from quality measures built on claims data to a new world of deep clinical phenotyping based on clinical data, advanced, biomarkers, genomics, and social and behavioral determinants of health.

### AL-HASHIMI RECEIVES NAS AWARD

Hashim Al-Hashimi, PhD, James B. Duke Professor of Biochemistry, has received the 2020 National Academy of Sciences Award in Molecular Biology. The award is supported by Pfizer, Inc., and recognizes a recent notable discovery by a young scientist under the age of 45 who is a citizen of the United States. It comes with a medal and a \$25,000 prize. Over the past 50 years the NAS Award in Molecular Biology has recognized many outstanding young biologists and has been a precursor to 14 Nobel Prizes.

The academy recognized Al-Hashimi for revealing the dynamic nature of RNA and DNA structures through innovative use of nuclear magnetic resonance (NMR) methods. His work has led to new understanding of DNA and RNA as dynamic structures, deepening our understanding of diseases such as cancer as well as helping to enable the development of new therapeutics that target RNA.

### OLDHAM NAMED DIRECTOR OF MEDICAL PHYSICS

Mark Oldham, PhD, has been named director of the Medical Physics Program. He is a professor in the Department of Radiation Oncology in the School of Medicine.

The Medical Physics Graduate Program is an interdisciplinary program primarily sponsored by the Departments of Radiology and Radiation Oncology with support from Physics, Biomedical Engineering, and Occupational and Environmental Safety (Health Physics). The program is in its 15th academic year and has been nationally and internationally recognized.

Oldham joined Duke in 2004 as an associate professor. His research interests include novel radiation and immunotherapy treatments, spatial fractionation, and methods and applications for 3D and advanced dosimetry. He has a longstanding interest in medical physics education and has taught in the Duke program for more than 10 years.

### BOULWARE, UBEL NAMED TO NATIONAL ACADEMY

**L. Ebony Boulware, MD'95, MPH**, and Peter Ubel, MD, have been elected to the prestigious National Academy of Medicine. Election to the academy recognizes individuals who have demonstrated outstanding professional achievement and commitment to service.

Boulware is a professor of medicine, chief of the Division of General Internal Medicine in the Department of Medicine, and vice dean for translational science in the School of Medicine and associate vice chancellor for research for Duke Health. She is director of the Duke Clinical and Translational Science Institute.

Boulware has spent much of her scholarly career investigating mechanisms to improve health care and outcomes for patients and populations with chronic health conditions.

Ubel is the Madge and Dennis T. McLawhorn University Professor of Business, Public Policy, and Medicine at Duke University. He is a physician and behavioral scientist recognized for his exploration of the role of values and preference in health care and decision making.

L. Ebony Boulware

Peter Ubel





Diego Bohórquez



Opeyemi Olabisi

## BOHORQUEZ, OLABISI NAMED NIH NEW INNOVATORS

Duke University School of Medicine researchers Diego Bohórquez, PhD, and Opeyemi Olabisi MD, PhD, have been given two of the National Institutes of Health director's New Innovator awards, which are for high-risk/high-reward work being done by early-stage investigators. The award provides \$1.5 million for a five-year project.

Bohórquez is an assistant professor in medicine and neurobiology. He came to Duke in 2010 as a post-doctoral fellow and joined the faculty in 2015. He will use the New Innovator award to explore links between autism spectrum-related disorders and the gut.

Olabisi, an assistant professor of medicine and nephrology, recently joined the Duke Molecular Physiology Institute from Massachusetts General Hospital and Harvard Medical School.

Olabisi will be using the New Innovator award to explore the functions of a gene called APOL1, which explains 70 percent of excess risk for non-diabetic kidney disease in people of recent African ancestry.

## POSS, TOBIN NAMED AAAS FELLOWS

Two of the seven Duke University faculty members most recently named Fellows of the American Association for the Advancement of Science are faculty in the School of Medicine. The prestigious appointment is obtained through peer nomination and is based on scientifically or socially distinguished efforts to advance science or its applications.

Kenneth D. Poss, PhD, James B. Duke Professor in the Department of Cell Biology and director of the Regeneration Next Initiative, was named for his distinguished contributions to the field of organ regeneration, particularly using zebrafish as a model to study mechanisms underlying heart regeneration.

David M. Tobin, PhD, associate professor in the Department of Molecular Genetics and Microbiology, was named for his distinguished contributions to the field of mycobacterial pathogenesis and host response, particularly using a zebrafish model to understand both bacterial and host contributions.

Kenneth D. Poss



David M. Tobin



## SOM FACULTY MEMBERS AWARDED DISTINGUISHED PROFESSORSHIPS

Twelve faculty members in the Duke University School of Medicine have been awarded distinguished professorships. In total, Duke University awarded distinguished professors to 28 faculty members from eight Duke colleges and schools. Distinguished professorships are awarded to faculty who have demonstrated extraordinary scholarship in advancing science and improving human health.

The 2020 recipients from the School of Medicine are:

**David Ashley, MBBSm PhD, HS'94-'95**, Rory David Deutsch Professor of Neuro-Oncology

Nicole Calakos, MD, PhD, Lincoln Financial Group Distinguished Professor of NeuroBiology

**Michael Cohen-Wolkowicz, MD, PhD, HS'09**, Kiser-Arena Distinguished Professor

Kathleen Cooney, MD, George Barth Geller Distinguished Professor of Medicine

**Vance Fowler, AB'88, MD, HS'93-'96, HS'96-'99, MHS**, Florence McAlister Professor of Medicine

Steven George, PhD, PT, Laszlo Ormandy Distinguished Professor of Orthopaedic Surgery

Sue Jinks-Robertson, PhD, Mary Bernheim Distinguished Professor

**Manesh Patel, MD, HS'97-'01, HS'02-'06**, Richard Sean Stack Distinguished Professor

Sallie Permar, MD, PhD, Wilburt C. Davison Distinguished Professor

Ponugoti Rao, PhD, Richard and Kit Barkhouser Distinguished Professor

Albert La Spada, MD, PhD, Lincoln Financial Group Professorship of Neurobiology

Scott Soderling, PhD, George Barth Geller Distinguished Professor of Molecular Biology

## SAMPSON NAMED PDC PRESIDENT; FRIEDMAN BECOMES INTERIM CHAIR

John H. Sampson, MD, the Robert H., MD, and Gloria Wilkins Professor of Neurosurgery, stepped down from his position as chair of the Department of Neurosurgery on March 5, 2020, to become president of the Duke Private Diagnostic Clinic (PDC) in a full-time capacity. He had served as interim president of the PDC since 2018 while continuing to serve as department chair. Allan Friedman, MD, will serve as interim chair of the Department of Neurosurgery. Sampson served as chair of the Department of Neurosurgery since 2015, when the department was elevated from division to department status. During his tenure, the department grew by 25 faculty and more than doubled its research funding.

Dr. Friedman is the Guy L. Odom Distinguished Professor of Neurosurgery. He served as chief of the Division of Neurosurgery for 18 years, stepping down in 2014. He has played a key role in establishing Duke as one of the premier neurosurgery services in the United States.

## SINGAPORE, continued from page 8

the antibody test, researchers could determine that both members of the couple had indeed been infected with COVID-19 even though they were no longer symptomatic. One of them no longer had any virus in the bloodstream, so a standard SARS-CoV-2 test would have been negative.

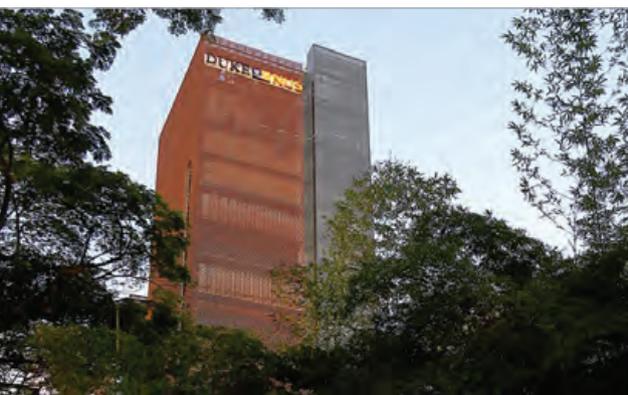
Wang is setting up collaborations with research teams around the world on studies using the antibody test. In particular, it could be used to understand whether children are less likely to acquire COVID-19, or whether they simply don't show symptoms. "If it's the latter," Wang says, "you can prove that by serology because even if the infection is mild, it still produces antibodies."

**"I always tell my junior scientists: during peacetime, publishing and working on your CV and grants are important, but during an outbreak, it's about having an impact on the ground."**

LINFA WANG

Researchers at Duke-NUS will also be collaborating with others to test vaccines in clinical trials. Duke-NUS, in collaboration with the SingHealth team, has extensive clinical trials capacity, and Singapore, with its multi-ethnic population, is an ideal site. Wang is in conversations with the World Health Organization (WHO) and the Coalition for Epidemic Preparedness Innovations (CEPI) about potential vaccine trials.

— By Mary-Russell Roberson



## MEDICAL EDUCATION, continued from page 9

didactics complete, they will spend most of their time seeing patients.

Medical students spend the third year conducting original research or other scholarly investigation. COVID-19 forced the suspension of most ongoing research at Duke, as much of the on-campus research operations pivoted to COVID-19.

Fortunately, most third-year students were nearing the end of their projects by mid-March. Some had already completed the laboratory or field portion and can finish the writing phase remotely. For students whose projects were cut short, their faculty mentors have been asked to develop alternate educational programs to complete the remainder of the semester.

Fourth-year students do elective clinical rounds. Most are scheduled to begin residencies in June. They have been allowed to continue to work in the clinical setting. They can continue to learn and will also make valuable contributions to Duke's health care mission, helping manage caseloads to free frontline providers to care for COVID-19 patients.

All the other degree programs within the School of Medicine have taken similar steps to enable instruction to continue. The Duke Physical Therapy (DPT) program is conducting classes virtually, using Zoom as the primary platform, and has revised its curriculum to front-load didactic content and move its psychomotor and lab-based skills instruction later in the year, whenever students and faculty are cleared to return

**"Our faculty got very creative in coming up with new ways to deliver instruction. And the medical education IT and AV folks have been outstanding in setting everybody up with platforms for remote delivery."**

ED BUCKLEY

to campus.

Students in the Physician Assistant (PA) program are taking their first preclinical year classes remotely. Second-year PA students have transitioned to a virtual didactic curriculum to supplement the clinical experiences they will conduct when they are able to return to the clinical training environment. Exam administration is occurring remotely, and the program has piloted standardized patient interviews through Zoom.

Buckley says he's proud of the spirit shown by School of Medicine students at all levels.

"They're volunteering in clinics, calling patients, serving as support resources, even doing community services like delivering food in addition to health care," he says. "They could just as easily have said, 'I'm going to go home and hibernate.' Instead they've stepped up and said, 'How can I help?'"

— By Dave Hart

MEDICAL

2

ALUMNI

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ASSOCIATION

2

AWARDS

0

## DISTINGUISHED ALUMNUS



### Philip Gold, AB'66, MD'70

Philip Gold is arguably the world's foremost expert on the neuroendocrine underpinnings of psychiatry and a pioneering investigator of the pathophysiology of major depression. Among many major contributions, he developed the prevailing hypothesis that depression represents a systematic dysregulation of the central nervous system stress system. He has significantly increased our understanding of neurotransmitter and neurohormonal abnormalities in depressive illness; described and delineated the mechanisms of the long-term medical consequences of depression; and helped elucidate the mechanisms of multiple antidepressants. Gold also illuminated the key role played by corticotrophin-released hormone (CRH), revealing that CRH is hyper-secreted in melancholic depression and hypo-secreted in atypical depression. Gold and colleagues have developed a CRH antagonist that has potential as a treatment not only for depression but for other stress response conditions such as post-traumatic stress disorder.

Gold has spent his entire career at the National Institutes of Health, holding numerous research and leadership positions, and he is a member of the Library of Congress Council of Scholars. He is one of the world's most-cited biomedical scientists, and he has been honored for his work with awards including the Curt Richter Prize, the Alan Walters Memorial Award, the Fish Memorial Prize, the Outstanding Service Medal and Meritorious Service Award from the United States Public Health Service, and the Foundation Fund Prize for Research in Psychiatry from the American Psychiatric Association.

**Education:** Duke University; Duke University School of Medicine

**Training:** Boston City Hospital; Massachusetts Mental Health Center, Harvard Medical School; National Institute of Child Health and Human Development

**Current Title:** Chief, Clinical Neuroendocrinology Branch, Intramural Research Program, National Institute of Mental Health



## DISTINGUISHED FACULTY

### L. Ebony Boulware, MD'95, MPH

Ebony Boulware is a nationally known researcher, educator, and academic leader who has made fundamental contributions to improving the quality and equity of health care and outcomes for individuals and populations affected by chronic health conditions including kidney disease and hypertension. Her work explores how the characteristics of individuals, health care providers, and health care organizations contribute to individuals'

health and inequities in care. She develops and studies pragmatic interventions to address these mechanisms.

One of the nation's leading experts on the causes and effects of racial and ethnic disparities in health care and outcomes, Boulware engages individuals, family members, community members, and other stakeholders in her work. Her research has provided key insights into the influence of social and environmental factors on health outcomes and generated new tools and infrastructure to support evidence-based interventions in the clinic and the community.

As director of the Duke Clinical and Translational Science Institute, she helps scientists at Duke and across the nation speed the pace at which their scientific discoveries reach individuals, families, and communities.

Boulware has published over 150 peer-reviewed articles and is a frequently invited expert lecturer on health disparities and patient-centered chronic kidney disease research. She is a tireless mentor to medical students, residents and fellows, and junior faculty, and she has been honored for her influential mentorship with numerous awards.

**Education:** Vassar College; Duke University School of Medicine; Johns Hopkins Bloomberg School of Public Health

**Training:** University of Maryland; Johns Hopkins University

**Current Title:** Eleanor Easley Professor of Medicine, Duke University School of Medicine; chief, Division of General Internal Medicine; director, Duke Clinical and Translational Science Award; vice dean for translational science; associate vice chancellor for translational research, Duke University.



## DISTINGUISHED SERVICE

### Debara Tucci, MD, MBA'13

Debara Tucci is a national expert on the causes, impact, and treatment of hearing impairment and loss. She is director of the National Institute on Deafness and Other Communication Disorders at the National Institutes of Health (NIH). Prior to going to NIH in 2019, she was on faculty in the Department of Head and Neck Surgery & Communication Sciences at Duke University School of Medicine for 26 years.

She was the founding co-chair of the Duke Hearing Center, which integrates auditory research and clinical otology practice on the Duke campuses. She contributed to the development of a national practice-based research network at the Duke Clinical Research Institute and performed research to enhance clinical care for otologic patients. In her work as director of the Cochlear Implant program, she conducted research and led development of a team devoted to care of patients with severe to profound hearing loss. In addition to her research and clinical

roles at Duke, she served in numerous leadership roles to advance Duke's academic mission and its commitment to integrity and diversity.

Nationally, she has served as president of the Association for Research Otolaryngology, the American Otological Society, and the American Neurotology Society.

Her current work as co-chair of the Lancet Commission on Global Hearing Loss allows her to pursue her passion for understanding and impacting hearing loss disability worldwide.

**Education:** University of Virginia; University of Virginia School of Medicine; Duke University Fuqua School of Business

**Training:** St. Joseph Mercy Hospital; University of Virginia School of Medicine; University of Michigan

**Current Title:** Adjunct professor, Department of Head and Neck Surgery & Communication Sciences, Duke University Medical Center; director, National Institute on Deafness and Other Communication Disorders, National Institutes of Health

## HUMANITARIAN



## Lisa Amaya-Jackson, MD, MPH

Lisa Amaya-Jackson is a child and adolescent psychiatrist and a tireless advocate for children and families who have experienced violence, trauma, abuse, and loss. With more than 30 years working in the field of children's exposure to trauma, post-traumatic stress disorder, and bringing effective treat-

ments to community providers and service systems, she has dedicated her professional career to developing and improving access to evidence-based mental health services for the most vulnerable children and their families.

As an active clinician, researcher, program leader, and policy educator, she has overseen and implemented improvements that have helped thousands of children across the U.S. recover from trauma, stay in school, strengthen relationships, and realize the opportunity to live fulfilling lives.

She is a co-founder of the Center for Child & Family Health in Durham, North Carolina, and she co-directs its NC Child Treat-

ment Program, a comprehensive, public mental health initiative that trains clinicians to deliver evidence-based treatments for trauma across the state.

Amaya-Jackson has helped raise the National Child Traumatic Stress Network (NCTSN) to its current prominence and advance its dedication to increasing access and quality of care to children and families across the U.S. through intense collaboration with other providers to build trauma-informed systems, state of the art training, and other resources. She is deputy director of the National Center for Child Traumatic Stress, which coordinates the 117 NCTSN sites nationwide.

**Education:** College of William & Mary; University of North Carolina at Chapel Hill

**Training:** University of North Carolina at Chapel Hill School of Medicine; University of California at Los Angeles

**Current Title:** Professor of Psychiatry and Behavioral Sciences, Duke University School of Medicine; director, Duke Evidence-based Practice Implementation Center; associate director and co-director of Child Trauma Training, Center for Child & Family Health; co-director, North Carolina Child Treatment Program; deputy director, National Center for Child Traumatic Stress.

## EMERGING LEADER



## Lejla Vajzovic, MD, HS'11-'13

Lejla Vajzovic has established an international reputation as a rising star in vitreoretinal surgery, research, and teaching. She is an ophthalmologist and vitreoretinal surgeon with expertise in pediatric and adult retinal diseases and surgery. She is interested in cutting edge technologies and recovery of vision in hereditary retinal diseases with retinal implants and stem cell technology.

She is a co-director of the Duke Pediatric Retina and Optic Nerve Center, and she directs the Duke Center for Artificial and Regenerative Vision, where she implants the Argus II "bionic eye" to restore vision to individuals with total blindness.

An influential educator, she organizes and directs several highly successful national and international courses, including the first-of-its-kind Advances in Pediatric Retina Course at Duke and the international Duke Fellows Advances in Vitreous Surgery Course. She

is director of Duke Eye Center's Continuing Medical Education program.

She has received numerous prestigious honors and awards for excellence in clinical care and ophthalmology research, including: the Retina Society Fellowship Research Award, the Heed Ophthalmic Fellowship Award and the Society of Heed Fellows Award, the Knights Templar Eye Foundation Career Starter Research Award, the PDC's Enhanced Academics in a Basic Laboratory Environment (ENABLE) Career Development Program Award, the American Academy of Ophthalmology Achievement Award, the American Society of Retinal Specialists Senior Honor Award; and the American Society of Retina Specialists Film Festival: Rhett Buckler Award.

**Education:** University of Missouri at Columbia; Mayo Medical School

**Training:** Bascom Palmer Eye Institute, University of Miami; Saint Louis University School of Medicine

**Current Title:** Associate professor of ophthalmology, Duke University School of Medicine.

## 1950s

**Lawrence M. Blum, MD'55**, is a retired dermatologist. He and his wife, Florence, live in Bridgeport, Connecticut. They have two sons and a daughter and three grandchildren.

**Clyde Norman Shealy, BS'53, MD'56, HS'56-'57**, is a specialist in pain management whose innovations include spinal cord stimulation, Transcutaneous Electrical Nerve Stimulation, cranial electrical stimulation, and a pulsed electromagnetic frequency device that puts the brain in gamma and relieves opioid craving. He founded the Shealy-Sorin Wellness Institute in Springfield, Missouri. Widowed in 2011, he lives in Fair Grove, Missouri, and has three children and five grandchildren.

**Nathan Ridgeway, MD'57**, is retired. He and his wife, Zeld, live in Kingsport, Tennessee.

**Edward H. Laughlin, MD'58**, is retired after a career as a general surgeon and professor of surgery, specializing in surgical oncology, at the University of Alabama Birmingham School of Medicine. He lives in Huntsville, Alabama.

**Donald H. Tucker, BSM'59, MD'58, HS'58-'62**, is retired from Physicians East, a practice he co-founded in Greenville, North Carolina. He lives in Greenville, and all four of his children are Duke alumni: **Lynn Tucker Grogan, AB'81** (deceased); **Donald H. Tucker Jr, AB'81**; **Susan T. Weaver, BS'83, MD'87**; and **Michael Arden Tucker, AB'85**.

**Robert Gibbs, MD'59, HS'60-'62**, and his wife, **Carolyn Alderman Gibbs, G'57**, moved from Oklahoma after 40 years in Muskogee to Williamsburg, Virginia. They have two sons—**Thomas Avery, MD, BS'89**; and Harrison—and four grandchildren.

**Andrew G. Wallace, BS'57, MD'59, HS'59-'61, '63 and '64, P'89**, is retired after a career that included service as chief of cardiology at Duke University School of Medicine (1969-79), CEO of Duke Hospital (1979-89), and dean of the Dartmouth Medical School (1989-98). He and his

wife, Barrie, live in Chapel Hill and have three children: Andrew, Michael, and **Kathleen, AB'89**.

**Patricia H. Winchester, BS'55, MD'59, HS'60**, is retired after more than 40 years as a professor of pediatric radiology at Weill Cornell Medical College in New York. She and her husband, Robert, live in New York, where he continues to practice at Columbia.

## 1960s

**W. Allen Addison, AB'56, MD'60, HS'60, '61-'62, '62-'65, '71-'72**, is retired after serving on the faculty at Duke University School of Medicine from 1976-2004. His contributions as a physician, teacher, and mentor has been honored with the W. Allen Addison Professorship of Obstetrics and Gynecology. He and his wife, **Sally Bender, BSN'60**, live in Hillsborough, North Carolina. They have three daughters, of whom one, **Rebecca A. Jordan, BSN'83**, is a Duke alumna; and eight grandchildren, including one School of Nursing alumna and another in the School of Medicine.

**Elaine Eyster Dye, AB'56, MD'60**, received a Lifetime Achievement Award from the Hemostasis and Thrombosis Research Society. She is a distinguished professor of medicine and pathology at the Penn State College of Medicine and director of the Hemophilia and Thrombosis Center of Central Pennsylvania. She lives in Hershey, Pennsylvania. She and her late husband, **Robert E. Dye, AB'50**, have two sons and six grandchildren.

**Lynn Fort III, MD'60**, is retired after a career in general and thoracic surgery. He and his wife, Marian, live in Charlotte, North Carolina.

**Larry H. Parrott, MD'60**, was elected elder emeritus at Bethesda Presbyterian Church in Camden, South Carolina. He and his wife, Joy, live in Camden.

**Donald C. Mullen, MD'61, HS'61-'69**, is now "finally truly retired" after a long and active career. After 20 years as a cardiac surgeon, professor of surgery and chief at St. Luke's Hospital at Medical College of Wisconsin, he attended and graduated from Princeton Seminary and spent the next 20 years doing medical work in more than

20 countries, an experience he documented in his book *A Radical Change of Direction*. In 2017, he was inducted into the Medical Mission Hall of Fame at Toledo University Medical School in Ohio. He was also elected mayor of Highlands, North Carolina, and served as a pastor at the Presbyterian church there. He lives in Newnan, Georgia.



**David S. Walton, MD'61**, won the Hinckley trophy for the fifth consecutive year at an annual classic boat regatta in Marblehead, Massachusetts. His children, he reports, are "grown and working." He lives in Boston.

**C. Thomas Caskey, MD'62, HS'63-'65**, is a professor of molecular and human genetics at the Baylor College of Medicine in Houston, Texas. He and his wife, **Peggy Peace Caskey, AB'61**, live in Houston. They have two children—**Caroline Thomas Goodyear, AB'88**, and Clifton Caskey—and three grandchildren.

**Emile L. Gebel, BS'58, MD'62, HS'62-'63, '63-'66**, attended the Davison Club's 50th anniversary as a charter member. He is a nurseryman and still in the plant business, having had a great sale last spring at Sarah P. Duke Gardens.

**Clay Franklin Church, MD'63, HS'66-'68**, is chief medical officer for IndusHealth, a medical travel program administrator. He has three adult children. He and his wife, Linda, live in Raleigh, North Carolina.

**Don Lucey, MD'63**, was presented with the Order of the Long Leaf Pine, one of the state of North Carolina's highest honors, in 2017. He and his wife, Shirley, live in Greensboro, North Carolina, and have three children.

**Irwin Arluk, MD'64**, works part-time as a general practitioner. He lives in Laguna Niguel, California. Two grandchildren are in college, and a third is applying to universities including Duke.

**John Karickhoff, MD'64, HS'65-'68**, retired in October 2019 after 51 years of practice in ophthalmology, including teaching for 25 years at Georgetown University. He lives in Fairfax, Virginia. Both of his children are Duke alumni: **Margaret Karickhoff, AB'99**, and **Julia Karickhoff, AB'97**.

**Carl J. Rubenstein, MD'64, HS'64-'65, '65-'70, '70-'72**, is a board member and immediate past president of the Interfaith Alliance of Oklahoma; member of the Oklahoma Academy for State Goals; board member of Red Earth, Inc.; and advisory board member of the Oklahoma Center for Community and Justice. A clinical professor of medicine emeritus, he is retired after a career in clinical lipidology and cardiology. He and his wife of 54 years, Debby, live in Oklahoma City, Oklahoma. They have children and grandchildren in Portland, Oregon; Florence, Italy; and San Antonio, Texas.

**Lewis Flint, AB'62, MD'65**, was elected to the American College of Surgeons (ACS) Master Surgeon Educators in 2018. He is editor in chief of *Selected Readings in General Surgery* for the ACS Division of Education. He lives in Chicago.

**Creighton Bolter Wright Sr., AB'61, MD'65**, is professor of surgery and health science and medical director of the Physician Assistant Program, which he played an active role in planning and developing, at the Mount St. Joseph University School of Health Sciences. He and his wife, Carolyn, live in Covington, Kentucky, and enjoy their 11 grandchildren.

**B. Titus Allen, BA'62, MD'66**, is retired. He and his wife, Thelma, live in Cary, North Carolina.

**William Barton Dick, MD'66**, is retired from orthopaedic surgery practice. He lives in Lexington, Virginia.

**David Charles Hitch, MD'66**, is a pediatric surgeon. He lives in Kettering, Ohio.

**Thomas F. Henley, MD'68, HS'69-'73**, continues his prowess in the U.S. National Senior Games by winning the gold medal at the 2019 event in the discus in the male age 75-79 category. In his nine years of participating in the event he has won two gold medals, four silver medals, and three bronze. He and his wife, Sandra, live in Greensboro, North Carolina.

## 1970s

**Walton W. Curl, MD'74**, maintains a part-time clinical practice at Asheville Orthopaedic Associates and serves as a board member for the Feagin Medical Leadership Program at Duke Medical Center. He and his wife, Kay, live in Biltmore Lake, North Carolina. They have two sons—**Michael, BS'98**, and Douglas—and three grandchildren.

**Daniel Goodenberger, MD'74**, is a professor of medicine at Washington University. He is active in the American College of Physicians (ACP) as governor of the Missouri chapter and member of the executive committee of the Board of Governors. He was elected to Mastership in ACP and fellowship in the Royal College of Physicians in London. He and his wife, Chris, live in Festus, Missouri, and have five children and eight grandchildren. Retirement, he says, "remains a theoretical possibility."

**David "Skip" Walters, AB'70, MD'74, P'03, P'07**, is retired from his career in colon and rectal surgery and now serves part-time on the faculty at Lake Erie College of Osteopathic Medicine Bradenton. He lives in Longboat Key, Florida.

**Bruce C. Wolff, MD'74**, is professor of surgery and former chair of the Department of Colon and Rectal Surgery at the Mayo Clinic in Rochester, Minnesota. He retired in 2013 and is a member of the supplemental staff. He is executive director of the American Board of Colon and Rectal Surgery. He and his wife, Vikki, live in Rochester and have three children: Katie Wolff, an MD/PhD student at Duke and the University of North Carolina; Oscar; and Charlie.

**George W. Rutherford, MD'79**, is the Salvatore Pablo Lucia Professor and head of the Division of Infectious Diseases and Global Epidemiology in the Department of Epidemiology and Biostatistics at the University of California, San Francisco,

where he holds appointments in epidemiology, preventive medicine, pediatrics, and history. He also holds an appointment in epidemiology at the School of Public Health at the University of California Berkeley, and he is a senior scientist in the Institute for Global Health Sciences, where he leads the Global Strategic Information Group, which works with the Centers for Disease Control, the World Health Organization, and others to control the HIV epidemic worldwide. He and his wife, Mary Workman Rutherford, a pediatrician and longtime director of the Department of Emergency Medicine at Children's Hospital Oakland, live in Piedmont, California. They have six children and two granddaughters.

**Robert King Tatum, AB'75, MD'79**, is in private practice as an OB-GYN in Knoxville, Tennessee. His hobbies include nature photography, fly fishing, medical mission service, scuba diving, and flying radio-controlled planes and helicopters. He and his wife, Stephanie, live in Knoxville.

## 1980s

**Jan Neal Cools, MD'83, HS'83, '83-'85, '85-'88**, is retired after a career in child psychology. She and her husband, **Joseph M. Cools, MD, HS'79, '79-'83, '87-'88**, live in Chapel Hill, North Carolina, and have two children: **Michael, BS'09**, and Angela.

**Jeffrey P. Baker, AB'80, MD'84, PhD'93, HS'88-'91**, is director of the Trent Center for Bioethics, Humanities & History of Medicine at Duke University. He and his wife, S. Alicia Ramos, live in Durham.

**David L. Feldman, AB'80, MD'84, HS'89-'92**, was appointed chief medical officer of The Doctors Company Group in August 2019. He continues to serve as vice president and chief medical officer at Healthcare Risk Advisors (HRA), a premier provider of medical malpractice insurance and risk management advisory services to physicians and hospitals in New York. HRA was recently acquired by The Doctors Company Group. He and his wife, Debra, live in Scotch Plains, New Jersey.

**Paul A. Hatcher, MD'84, HS'86-'90**, is an associate professor at the University of Tennessee Medical Center, where he maintains an academic urology service with a growing urology residency program. He and his wife, **Tina S. Hatcher, MBA'82**, live in Knoxville, Tennessee, and have two sons.

**Joseph R. Newton Jr., MD'84**, was appointed president and chief of Sentana Mid-Atlantic Cardiothoracic Surgeons at Sentana Heart Hospital in Norfolk, Virginia. He has managed the Heart and Living program there—the largest heart program in Virginia, with 17 years in the *U.S. News & World Report* top 50 rankings—since 2014. He remarried, and he and his wife, Michella Parr Newton, live in Norfolk and have two boys, ages 10 and 3. His older children include William, Caroline, and Emily.

**Sarah J. Seabolt, MD'84**, practices internal medicine in Honolulu, Hawaii.

**Joseph A. Hill, MD'87, PhD'87**, is professor of medicine and molecular biology and chief of cardiology at the University of Texas Southwestern Medical Center in Dallas. He is editor-in-chief of *Cardiology*. His wife, Beverly, founded and runs a nonprofit focusing on global women's health and welfare. They live in Dallas and have two children: **Christopher A. Hill, AB'18**, and Teddy Hill.

**Conrad L. Flick, MD'89**, is a physician and medical director at the Family Medical Association of Raleigh and co-president of the Community Cure Physician Network. He lives in Raleigh and has two children.

## 1990s

**Mark McSwain, MD'94**, has been doing primary care for the past 20 years and opened an urgent care clinic, where he is medical director, five years ago. He is also occupational medical director for the Nucor Steel Auburn mill. He and his wife, Teresa, live in Skaneateles, New York, and have four children.

**Joff G. Thompson, MD'94**, is an orthopaedic surgeon at Valley Bone and Joint Clinic. He and his wife, Maria, live in Grand Forks, North Dakota, and have four children.

**Libbie Parker McKenzie, BS'95, MD'99, HS'00-'01, '01-'03, '05**, is vice president of IQVIA, a pharmaceutical services company. She and her husband, **Alexander Ross McKenzie, AB'95**, live in Chapel Hill, North Carolina.

## 2000s



**Brian Lima, MD'02, HS'02-'09**, director of heart transplant surgery at North Shore University Hospital in Manhasset, New York, has launched the first heart transplant program on Long Island. He also has published a book, *Heart to Beat: A Cardiac Surgeon's Inspiring Story of Success and Overcoming Adversity—the Heart Way*, available on [amazon.com](https://www.amazon.com) and Barnes & Noble. He lives in Roslyn, New York.

**Robert G. Micheletti, MD'08**, is assistant professor of dermatology and medicine at the Perelman School of Medicine at the University of Pennsylvania. He and his wife, Dorothy Leung, live in Philadelphia and have two children.



**Stephen G. Odaibo, G'09, MD'10, HS'10-'11**, has been recognized by *The Ophthalmologist* as a leading expert in the field of artificial intelligence (AI) in ophthalmology. He shares his thoughts in the December 2019 and February 2020 issues of the magazine. He also had the honor of being on the AI expert panel at the Technology Pavilion of the American Academy of Ophthalmology annual meeting in October 2019. He lives in Houston, Texas.

**Christian Horazek, BS'09, MD'14**, is an anesthesiologist at the Creighton University School of Medicine in Omaha, Nebraska. He and his wife, Ruth, live in Omaha.

## MAKING THE JUMP

**A**my Arundale, DPT'11, has spent virtually her entire life involved in soccer: as a player, coach, trainer, biomechanical researcher, and clinical physical therapist.

So it was a bit of an adjustment when she was hired in the spring of 2018 as a physical therapist and biomechanist for the NBA's Brooklyn Nets. Basketball and soccer involve different sorts of movements on different surfaces, for one thing, and that has implications for injury risks.

"And obviously, you're working on much larger human beings," says Arundale, one of a relative handful of women working in NBA training rooms. "We laugh about it in the training room, because if you take one of our larger players' shoes, you can actually fit our shoes inside their shoes."

Still, basketball wasn't completely foreign to Arundale, the 2019 recipient of the Duke Doctor of Physical Therapy (DPT) program's Emerging Leader Alumni Award. At Duke, you can hardly fail to absorb hoops to some degree. "I camped out two of my three years at Duke," Arundale says.

The similarities between basketball and soccer, she says, outweigh the differences: knees, after all, are knees. Arundale helps injured players recover and rehab, and she oversees movement assessments for current players and potential draftees. She employs direct observation, video, motion capture technologies, tests that measure strength and acceleration, and other methods to evaluate each player's movements and, if appropriate, recommend changes.

"We want to minimize injury risk and optimize performance," she says. "We create a sort of big picture of each player from a biomechanical perspective. Then we can work with them to improve movement patterns to help a player get stronger when he's driving to the basket or land more safely after a jump shot."

Arundale's path to the Nets began far from Brooklyn, in Fairbanks, Alaska, where she grew up and developed her passion for soccer. She



Arundale is a physical therapist and biomechanist for the Brooklyn Nets.

played as a child, and she both played and coached in high school before leaving the frozen north for Haverford College in Pennsylvania, where she played, coached, worked in the training room, and even competed for a season in the Scottish Women's Premier League during a study abroad year.

With graduation came a decision. "I wanted to make a career in soccer," she says. "I thought my options were coaching, orthopaedic surgery, or physical therapy. I'd coached quite a bit, but I wanted more academic

stimulation, not to mention more job stability. I'd spent some time observing orthopaedic surgeons, and I realized I really appreciated the relationships that you develop working with people as a physical therapist."

She explored a number of schools, but the admissions staff at the Doctor of Physical Therapy (DPT) program at Duke went out of its way to make her feel welcome, and by the end of her day on campus, her mind was made up. "Duke blew every other place I'd visited out of the water," she says.

Arundale thrived at Duke, where she won the 2011 DPT Outstanding Student Award. She gained invaluable clinical experience, made connections, conducted original research, and discovered a passion for exploring the intersection, as she puts it, "where medicine meets sports."

After graduating, she completed a PhD from the University of Delaware and then a post-doctoral fellowship at Linköping University in Sweden. She has published numerous papers and clinical guidelines for anterior cruciate ligament injury prevention, and she's been active in the American Physical Therapy Association, serving on its Sports Section Research Committee and Leadership Development Committee and receiving the 2017 APTA Emerging Leader Award.

**"We create a sort of big picture of each player from a biomechanical perspective. Then we can work with them to improve movement patterns to help a player get stronger when he's driving to the basket or land more safely after a jump shot."**

AMY ARUNDALE

"...if you take one of our larger players' shoes, you can actually fit our shoes inside their shoes."

AMY ARUNDALE

LEON KIRKBECK - AUGUSTO

All along, Arundale has balanced her research with clinical physical therapy, working with organizations including the Carolina Railhawks and Atlanta Silverbacks—and now the Brooklyn Nets.

"Everybody associated with the team has been terrific," Arundale says. "It's a good challenge, and I'm enjoying it."

NBA training rooms have long been largely a male province. But that is changing; in fact, two other women from the Duke DPT program are also working with NBA teams:

**Erin Sierer, DPT'07**, (Minnesota Timberwolves) and **Kristen Crenshaw, DPT'17**, (Orlando Magic).

Despite her responsibilities, Arundale has managed to stay active on the playing field—although her sport of choice has become Australian Rules Football, which is similar to rugby. Arundale has qualified for the U.S. National Team and will play in the World Cup in Australia this summer, during the NBA's off-season.

"Duke prepared me incredibly well for a career in physical therapy," Arundale says. "The education, the faculty support, the clinical rotations, the networks ... I attribute a lot of where I am now to Duke."

— By Dave Hart

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## HOUSE STAFF

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### 1950s

**Lewis Lefkowitz, MD, HS'56-'57**, and his wife, **Judith Hudson Lefkowitz, BSN-RN'56**, live in a model retirement home in Nashville, Tennessee, just one mile from their family home of 54 years and Vanderbilt University, where he is a professor emeritus. They have three sons—David, Jerry, and Paul—and three grandchildren.

**John W. Freese, MD, HS'57-'64**, is retired from a career in general surgery and surgical oncology. He and his wife, Jane, live in Fort Worth, Texas. They have three daughters, 10 grandchildren, and four great-grandchildren.

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### 1960s

**William S. Tunner, MD, HS'60-'64**, is retired from the Virginia Urology Center, which he co-founded in Richmond, Virginia. He is an equestrian and fox hunter and a member of the Central Virginia Chapter of the Military Officers Association of America and the American Legion. He and his wife of 54 years, Sallie, live in Manakin Sabot, Virginia, and have three children and four grandchildren.

**Joel R. Temple, MD, HS'60-'61, '63-'67**, is a physician working in allergy and internal medicine. He and his, Mary Jane, live in Dover, Delaware, and have eight children and 21 grandchildren.

**Marshall Dunaway, MD, HS'64-'66, '66-'67, '67-'68**, is retired from patient care but still runs grand rounds for medical students and continuing medical education students at Florida State University. He was awarded a 2019 Special Educational Medal by Archbold Memorial Hospital in Thomasville, Georgia. He and his wife, Linden, live in Thomasville.

**W. Robert (Bob) Hudgins, MD, HS'64-'65**, is a retired neurosurgeon who developed and markets, via the Apple Store, an app called Lobak, that shows people how to self-examine for the causes of low back pain. He and his wife, Cynthia, live in Dallas, Texas.

**Curtis J. Krock, MD, HS'65-'66**, is retired after a career in pulmonary and internal medicine. He has two children, and he and his wife, Susan, live in Champaign, Illinois.

**George Patrick Henderson, MD, HS'66-'67, '67-'69**, retired from private practice in 2003 after a career in otolaryngology and head and neck plastic surgery. He served part-time for the Department of Veteran's Affairs from 2004-2018. He lives in Southern Pines, North Carolina, and has three daughters and six grandchildren.

**Stephen "Rick" Schaal, MD, HS'64-'66, '66-'68**, is retired from clinical practice but continues to teach as a professor of medicine emeritus in cardiology at the Ohio State University College of Medicine. He lives in Columbus, Ohio.



**Douglas P. Zipes, MD, HS'64-'66**, is editing two cardiology journals and writing a bi-weekly health column for the *Saturday Evening Post*. He also keeps five textbooks up to date and enjoys writing fiction as well. His fourth novel, *Bear's Promise*, is a fictionalized story of a doctor testifying against multiple sudden death cases from being TASER-ed. It is available on [Amazon.com](https://www.amazon.com). He lives in Carmel, Indiana.

**John W. Hammon Jr., MD, HS'68-'69, '72-'78**, attended his 50th medical school reunion in New Orleans and received a Lifetime Achievement Award, which he says, "took me by surprise, but made me very proud." He and his wife, Lisa, live in Lewisville, North Carolina.

**Wayne B. Venters, MD, HS'68-'72, P'91, P'94**, is on the teaching staff at Elson S. Floyd College of Medicine in Spokane, Washington. He practiced orthopaedics in his hometown of Jacksonville, North Carolina, from 1972 to 2001 before moving to Spokane. He and his wife, Linda, live in Spokane, where they "ski, snowshoe, bike, and hike." They have two daughters: **Lara Raban, AB'91**, and **Gayle Swayne, AB'94**; and five grandchildren.

**James Krook, MD, HS'69-'73**, is retired after practicing oncology for 30 years in Duluth, Minnesota. He has performed local tenens in New Zealand. He and his wife, Mary, live in Duluth.

**Lewis Lipsius, MD, HS'69-'72**, is retired after a career in psychiatry. As a member of the Marietta Rotary Club in Marietta Georgia, he consults and works with MUST Ministries. He lives in Marietta.

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### 1970s

**Marc K. Drezner, MD, HS'70-'72, '72-'75**, received the University of Wisconsin School of Medicine Lifetime Achievement Award in 2018. He is professor of medicine emeritus and senior associate dean emeritus at Wisconsin. He and his wife, Sherree, live in Chapel Hill, North Carolina.

**H. Randolph Frank, MD, AB'64, HS'73-'76**, continues in active practice in ophthalmology. He and his wife of 49 years, Kristin, live in Colorado Springs, Colorado, and have three children and four grandchildren.

## FROM ETHICIST TO ACTIVIST

*The Silence of the Lambs*, the 1991 award-winning movie in which Sir Anthony Hopkins plays Hannibal Lecter, a sociopathic psychiatrist and cannibalistic serial killer, is considered one of the great films. But for **Mark S. Komrad, MD'83**, a clinical psychiatrist and medical ethicist, it was more than a horror movie. It was a reflection of how the public perceives psychiatry, and a reminder of why he hesitated to go into the field in the first place.

"I was concerned about the negative feelings and the stigma against psychiatrists that the movie portrayed," says Komrad.

He wanted to change that perception. He wrote a manifesto arguing that psychiatrists need to take better control of their image and push back against stereotypical media portrayals. He shared his piece with colleagues, and two weeks later Komrad was invited to *Doctors on Call*, a national radio talk show about psychiatry on the American Radio Network. After that first appearance, he was asked to host the show, and *Komrad on Call* was born. He led the weekly show for five years and talked to thousands of listeners. In the mid-90s, he became a regular psychiatrist guest on the National Public Radio show *Sunday Rounds* with John Stupak and a frequent guest on TV and radio talk shows discussing psychiatric issues. He consulted for Hollywood directors to help ensure accurate portrayals of psychiatrists in feature films, and even appeared in one.

One of the most common questions Komrad received from listeners was how to convince a friend or loved one to get psychiatric evaluation and treatment. That question, along with his travels around the country doing workshops and lectures on the topic and counseling many families, inspired him to write the book, *You Need Help: A Step-by-Step Plan to Convince a Loved One to Get Counseling* (Hazelden Press).

### FOLLOWING HIS FATHER'S FOOTSTEPS

Komrad's father, **Eugene L. Komrad, MD'56**, was a chief surgeon for the U.S. Air Force stationed in the Far East, and Mark Komrad spent

his childhood in Japan, Vietnam, and Florida. As an undergraduate student at Yale University, he wrote a paper on bioethics that won an award at a conference that was held at Duke. That visit made an impression.

"I was already curious about Duke, and coming for a conference and winning the award made it even more familiar to me, and I decided to come to Duke to medical school," he says. Komrad followed his father's footsteps to medicine and came to Duke in 1979.

His interest in philosophy, ethics, and sciences attracted him to psychiatry. At Duke, he met **Allen Dyer, MD'72, PhD'80**, an expert in medical ethics, who was a faculty member in the Departments of Psychiatry and Behavioral Science. Dyer recommended Komrad for a fellowship at the Hastings Center, a bioethics research institute in Garrison, New York, where he wrote a paper on medical ethics that was published in textbooks around the world.

Komrad enjoyed the psychiatry rotations at Duke but found himself reluctant to pursue a career in a discipline he felt didn't get the same respect as other medical fields. After graduating from Duke, he applied for residency in internal medicine at

Johns Hopkins. Halfway through his first year, he decided that wasn't the right path for him after all. "I was far more interested in sitting with my patients in the evenings after rounds and talking to them about their lives than checking their EKGs and their bloodwork," says Komrad.

He switched to a psychiatry residency. "I met with the director of the residency and told him that, unlike my father, I'm not good with scalpels," Komrad says. "He said, 'In psychiatry, words are our scalpel.'"

Komrad has worked in psychiatry ever since. He became an attending psychiatrist on the Treatment Resistant Psychotic Disorders Unit at

**"I met with the director of the residency and told him that, unlike my father, I'm not good with scalpels. In psychiatry, words are our scalpel."**

MARK S. KOMRAD



Sheppard Pratt Hospital in Maryland. An expert on psychiatric ethics, he chaired the hospital's ethics committee for 25 years and has been a member of the Ethics Committee of the American Psychiatric Association. Currently he serves on the teaching faculty of Johns Hopkins School of Medicine, the University of Maryland, and Tulane University.

MORAL QUESTIONS

Among the ethical issues Komrad has addressed over the years, one in particular has captured his attention. Physician-assisted suicide is legal in some countries in Europe, Canada, and in several U.S. states. In most places, physician-assisted suicide is allowed only in cases of terminal illness, but a few jurisdictions, notably Belgium and The Netherlands, allow patients with mental illness

**"I feel that killing does not belong in the house of medicine, should not be a part of palliative care, and especially not for psychiatric patients. Psychiatrists prevent suicide, not provide it."**

MARK S. KOMRAD

access to the procedure. Komrad is deeply opposed to the practice.

"I found it profoundly disturbing that in Belgium and the Netherlands, a significant number of psychiatric patients every year are voluntarily euthanized by their own treating psychiatrists," says Komrad. "I feel that killing does not belong in the house of medicine, should not be a part of palliative care, and especially not for psychiatric patients. Psychiatrists prevent suicide, not provide it."

The issue has transformed his career from ethicist to activist, and he has become one of the leading figures in the country expressing ethical concerns about this issue. Komrad has addressed the parliaments of Sweden and Norway, met with policymakers in Brazil, and consulted to the government of Canada, and he lectures at conferences and psychiatry departments around the country.

— By Aliza Inbari

**Lee H. Haller, MD, HS'73-'75**, is retired after "a great career" in adult, child, and forensic psychiatry, including private practice and faculty service at the Children's National Hospital in Washington, D.C. He and his wife of almost 50 years, Marcia, travel frequently on alumni trips. They have two children, one of whom, **Michelle Leigh Haller, AB'98**, is a Duke alumna.

**Ben D. Johnson, MD, HS'73-'75**, is a medical consultant for Social Security Disability. He and his wife, Nelda, live in Little Rock, Arkansas.



**Robert Saul, MD, HS'76-'79**, is the author of *My Children's Children: Raising Young Citizens in the Age of Columbine* and other books, including *Conscious Parenting: Using the Parental Awareness Threshold*, due out this year. He served in roles including medical director of general pediatrics at the Prisma Health Children's Hospital-Upstate in Greenville, South Carolina, and currently holds a part-time role at the Ferlauto Center for Complex Pediatric Health. He lives in Greenwood, South Carolina.

**William H. Beute, MD, HS'70-'74**, is senior staff child psychiatrist at Pine Rest Christian Mental Health Services in Grand Rapids, Michigan. He lives in Grand Rapids.

**Robert A. Wilson, MD, HS'74-'76, '76-'77**, has been in private practice in plastic surgery and ENT for 40 years. He is chairman of the board of Greenville Technical College and chair of local theater, art museum, and Meals on Wheels boards. He and his wife, Teresa, live in Greenville, South Carolina, and have two sons, both in medical school.

**Thomas Lucas Tiller, MD, HS'75-'77**, won the Algernon Sidney Sullivan Award at Wofford College in 2008. He is retired but stays busy auditing classes on Socrates, music theory, exoplanets, and ancient books at Furman University and Wofford

College. He and his wife, Lucy, live in Greenville, South Carolina, and have two children and two grandchildren.

**Dennis A. Clements III, MD, HS'73-'76, '86-'87, '87-'88**, recently transitioned to professor emeritus of pediatrics at Duke University School of Medicine but is still teaching part-time in global health, nursing, pediatrics, and family medicine. He is a senior advisor for the Duke Global Health Institute. He and his wife, Martha Ann Keels, live in Chapel Hill, North Carolina, and have three children and seven grandchildren, all between 1 and 6 years of age.

**William Michael Lieppe, MD, HS'75-'78**, practices interventional cardiology at Emory Heart and Vascular Center. He lives in Sandy Springs, Georgia.

1980s

**Jessica Schorr Saxe, MD, HS'77-'80**, is the chair of Health Care Justice-North Carolina and a board member for Physicians for a National Health Program. She and her husband, Allen B. Saxe, live in Charlotte, North Carolina. They have four children, one of whom—**Talia D. Saxe, AB'11**—is a Duke alumna.

**Robert Schaaf, MD, HS'80**, is chairman of the board of directors and president of Curi, a medical mutual company. Previously he was president and managing partner of Wake Radiology and, before that, chairman of the WakeMed radiology department. In 2015, he was presented with the Order of the Long Leaf Pine, one of North Carolina's highest honors. He and his wife, **Diane G. Schaaf, PhD'71**, live in Raleigh, North Carolina.

**John L. Durand, MD, HS'82**, recently assisted in the designing of the new clinical skills curriculum at Texas Christian University Medical School. He lives in Fort Worth, Texas.

## OBITUARIES

**Gordon Benson, MD'56**, died December 26, 2019. He was 88. He was a gastroenterologist and liver specialist who combined research and teaching during a career that spanned 50 years. After earning his medical degree at Duke, he served as a captain in the Medical Service at the U.S. Air Force Hospital in Wiesbaden, Germany. He did his residency at New York Hospital-Cornell Medical Center and a fellowship at Yale University. He served on the faculty at Rutgers Medical School, Thomas Jefferson University Hospital, and the University of Medicine and Dentistry of New Jersey (UMDNJ), where he was associate dean-in-charge at the UMDNJ-Robert Wood Johnson Medical School from 1989 to 2000. He was a member of the American Federation for Clinical Research, the American Association for Study of Liver Disease, and a Fellow of the American College of Physicians and the National Digestive Diseases Advisory Board of the National Institutes of Health.



**John A. Feagin Jr., MD'61, P'83, P'87, P'96**, died September 1, 2019. He was 85. A 1955 graduate of the United States Military Academy at West Point, he completed his training at Tripler Army Medical Center in Hawaii and Walter Reed Army Medical Center in Washington, D.C. He served as an orthopaedic surgeon in Vietnam and at Keller Army Hospital and was team physician for the Army athletic teams. He retired from the Army as a colonel in 1979 after serving as commander of Keller Army Hospital. He returned to Duke in 1989 as associate professor of surgery and team physician for Duke Athletics. He retired from clinical practice in 1999 and remained at Duke as associate professor emeritus of orthopaedic surgery. In 2009, the Feagin Leadership Program was established at Duke University to honor his legacy of leadership in medicine. He was an active mentor to the Feagin Scholars, preparing and inspiring young medical professionals for their leadership challenges. He was president of the American Orthopaedic Society for Sports Medicine (AOSSM); co-founder of the AOSSM Sports Medicine Traveling Fellowship Program; and a member of the United States Military Academy Board of Trustees.

**Irwin Fridovich, PhD'55**, James B. Duke Professor Emeritus of Medicine and a familiar figure on the Duke campus for more than 60 years, died on November 2, 2019. He was 90. Fridovich was internationally known for his work on the body's responses to "free radicals," dangerously corrosive oxygen molecules that can cause serious damage to tissues if left unchecked. Born in New York City, Fridovich earned his undergraduate degree at City College in New York. He came to Duke as a graduate student in 1952, earning his PhD in biochemistry. He joined the Duke faculty in 1961 and was promoted to full professor in 1971. In the late 1960s, working with graduate student **Joe M. McCord, PhD'70**, Fridovich discovered the enzyme superoxide dismutase (SOD), which living cells use to defuse a reactive form of oxygen called superoxide, now more commonly referred to as oxygen free radicals. Fridovich published more than 500 academic papers that have been cited more than 51,000 times. In 1997 he shared the Elliott Cresson Medal from the Franklin Institute with McCord. Fridovich never missed a dinner with his wife and two daughters, one of whom, **Sharon Fridovich Freedman, BS'81, MD**, is a professor of ophthalmology at Duke University School of Medicine.

**Louise E. Friend, MD'54, P'88**, died July 12, 2019. She was 89. She was born in Accident, Maryland. Her father was a two-term state senator, and her mother was a teacher. She played basketball in college, met her husband at Duke University School of Medicine, gave birth to her five sons during her medical training, and practiced dermatology in Monterey, California, for over 50 years. She enjoyed hosting her extended family, playing tennis, and traveling.

**Miles C. Gregory, MD'59**, died Dec. 12, 2019. He was 89. After graduating from high school, he enlisted in the U.S. Marines and then earned his undergraduate degree at the University of North Carolina at Chapel Hill, where he

was an active football player, wrestler, boxer, and member of Zeta Psi fraternity. A star athlete, he was the 1951 Southern Conference wrestling champion, the 1953 Southern Conference boxing champion, and the unanimous choice as the winner of the Patterson Award, presented to the top overall athlete at UNC. After earning his MD at Duke, he did his residency at Charity Hospital in New Orleans, Louisiana, associated with Tulane University. He practiced medicine in Halifax County, North Carolina, for over 40 years.

**H. Lee Howard, BA'40, MD'43**, died September 28. He was 100. He received his undergraduate degree and MD from Duke, and also did trained in pathology at Duke. He was a lieutenant junior grade in the U.S. Navy Medical Corps during World War II, serving in Europe, including landing at Omaha Beach on D-Day, and in the Pacific. After the war, he practiced pathology as a senior partner at Howard Clinical Laboratory in Savannah, Georgia, until his retirement in 1984. He was the first pathologist and director of the residency training program at Memorial Hospital as well as the first medical director of the regional Red Cross Blood Bank. He was a board-certified diplomat in pathology, member of the American College of Clinical Pathology, president of the Georgia Association of Pathologists and the First District Medical Society, and councilman and chairman of a number of committees of The Medical Society of Georgia.

**Gordon Henry Ira Jr., AB'50, MD'55**, died June 21, 2019. He was 90. He began his residency at Duval Medical Center, now University of Florida Health Shands Hospital, and then enlisted in the U.S. Navy, where he ran the Charleston Naval Hospital's medical ward. After his stint in the Navy, Gordon returned to Duke for his medical residency and cardiology fellowship. He was a practicing cardiologist in Jacksonville, Florida, for 35 years before retiring in 1998. He designed and started the first critical care unit in Jacksonville and was chairman of the Jacksonville Inter-Hospital Coronary Care Committee. He was chief of medicine for 25 years at St. Luke's Hospital and was honored for his work with the creation of the Gordon H. Ira Jr., MD, annual lectureship series. He also served on the mayor's committee to establish the first medical rescue program in Jacksonville.

**Douglas Anthony Medlin, MD'73**, died April 19, 2019. He was 70. He was born in Lexington, Kentucky, and completed his undergraduate studies at St. Louis University before earning his MD at Duke. Specializing in geriatrics, he cared for veterans at the Chillicothe Veterans Affairs Medical Center in Ohio, where he worked for the majority of his medical career. He was an active member of the Chillicothe Jaycees and frequent golfer at the Chillicothe Country Club. More recently, he was involved with the Chillicothe Knights of Columbus, the First Capital Enterprises Board, and activities at St. Peter Parish. He was a proud member of the St. Peter Parish choir and enjoyed entertaining visitors with singing and guitar playing. He also composed some of his own songs and had a garage-band for many years.

**Martin Oken, MD'65**, died July 23, 2019. He was 79. Born in Rochester, New York, he attended medical schools at the University of Michigan and Duke. His training continued at the University of Rochester, NYU Medical Center, and in El Paso, Texas, where he served for two years in the U.S. Army. He worked for 18 years at the Minneapolis Veterans Medical Center and rose to full professor at the University of Minnesota Medical School. The pinnacle achievement of his career was helping to create and actualize the vision of The Virginia Piper Cancer Institute, where he was medical director from 1993-2003. He was a source of comfort, wisdom, and hope to his patients, including those in Litchfield, Minnesota, where he was a consulting doctor for 22 years. He co-authored over 115 articles in medical publications.

**George Wesley Paulson, MD'56, HS'57-'59, P'79, P'85, GP'17**, died July 25, 2019. He was 88. He served for two years as chief neurologist at Womack Army Hospital and then was an instructor at Duke University School of Medicine and chief of neurology at the Durham VA hospital. He joined the faculty at the Ohio

State University College of Medicine in 1967. After a decade of private practice, he returned to OSU, where he served in roles including Kurtz Professor, founder and first chair of the Department of Neurology, and chief of staff. He played a key role in developing therapies for Parkinson's disease and related disorders. He was a leader in numerous national organizations and was a Fellow in the American Academy of Neurology and the American Neurological Association. He received a Distinguished Alumnus Award from the Duke Medical Alumni Association in 1997. Other honors include OSU Distinguished Service, Distinguished Faculty, and Teaching awards, and the Harry LeFever Award for Neuroscience. His son **Erik Paulson, MD'85, HS'91**, is chair of the Duke Department of Radiology.

**Evelyn D. Schmidt, BS'47, MD'51**, died August 15, 2019. She was 93. She earned her undergraduate degree Phi Beta Kappa and her MD at Duke. She trained in pediatrics at Babies and Children's Hospital in Cleveland, Ohio; Jefferson Hospital in Philadelphia; and Yale University Hospital. She earned a master's degree in public health from Columbia University. She practiced medicine in Philadelphia and New York City before moving to Durham in 1971, where she became executive director of Lincoln Community Health Center and served in that position for 40 years until retirement in 2011. She was an associate clinical professor in the Department of Pediatrics and assistant clinical professor in the Department of Community Medicine at Duke University Medical Center, and was attending physician in the Department of Pediatrics at Durham Regional Hospital. She was active in more than 20 organizations and was the recipient of numerous honors and awards.

**Rhett P. Walker, MD, HS'53-'55**, died November 16, 2019. He was 92. He served aboard the *USS Astoria* and *USS Vicksburg* during World War II in the Pacific. He graduated Phi Beta Kappa from the University of Alabama in 1948. He received his MD from the University of Alabama Medical School in 1952 with Alpha Omega Alpha honors. He completed research fellowships at Alabama and Harvard Medical School and did his residency in internal medicine at Duke University School of Medicine. He maintained his own medical practice in Mobile for almost 20 years and then spent more than 25 years practicing internal medicine and cardiology on Mobile's Bay's Eastern Shore. He also served as the plant physician at Alcoa and Diamond Shamrock and as a vocational rehabilitation consultant, medical director at Villa Mercy Hospice, and president of the Baldwin County Medical Society and the Thomas Hospital Medical Staff.

#### FACULTY

**Onyekwere E. Akwari (Onye)**, professor emeritus of surgery, died April 14, 2019. He was 76. He was the first African American surgeon at Duke University. A clinician and scientist, he organized the first meeting of the Society for Black Academic Surgeons, first held at Duke University. After receiving his MD at the University of Southern California and training at the Mayo Clinic, he was recruited to Duke University School of Medicine by the late David C. Sabiston Jr., MD, in 1978. He served on the Duke University School of Medicine's Admissions Committee and on Duke University's Faculty Governance Academic Council. He also served on Duke's Athletic Council. He was a member of the American Surgical Association, a fellow of the American College of Surgeons and the Royal College of Surgeons of Canada, past head of the surgical section of the National Medical Association, and served on committees of the American College of Surgeons and the Society for Surgery of the Alimentary Tract.

# SOM Magnify

A closer look at the people of the Duke University School of Medicine and their inspiring stories  
[magnify.duke.edu](http://magnify.duke.edu)

## Responding to Pandemics: Past, Present and Future



School of Medicine faculty developed a new online course in world pandemics for medical students during the COVID-19 crisis focused on history, the current outbreak, health system policy, and medical practice.

## Women's Health: It's Personal for Nimmi Ramanujam



Despite feeling limited by her gender at an early age, biomedical engineer Nimmi Ramanujam now embraces it and has devoted her career to helping women in all countries have better access to cervical cancer screening.

## Duke Students Bridge the Classroom with Community Through Root Causes



Partnering with Duke clinics, medical students volunteer their time to make sure that all Durham residents have access to fresh produce and recipes.

## VIRTUAL MATCH DAY



Kelly Buchanan is going to Massachusetts General Hospital.



Melissa Ross is going to University of Michigan.



Tori Wickenheisser is staying at Duke.

### CONGRATULATIONS TO THE CLASS OF 2020 ON MATCH DAY!

Medical students shared their Match Day moments with the Duke community and alumni on March 20. The students received envelopes digitally at noon and quickly shared their exciting news on social media and other digital platforms.

A total of 115 Duke Med students participated and are headed to some of the nation's most prestigious residency programs.

#### Among the institutions where students matched:

- 28** are staying at Duke for residency
- 8** are going to Harvard
- 6** are going to Washington University (St. Louis)

- 4** are going to Stanford University
- 4** are going to University of Washington (Seattle)
- 4** are going to Hospital of the University of Pennsylvania
- 4** are going to University of North Carolina
- 3** are going to UC San Francisco
- 3** are going to Columbia University