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Message from the Chair 3
Dynamic Equilibrium 4
Team-Based Gender Care 8
1 Duke Periop 9
Gene Therapy 10
Clinical Trials 10
Grants & Publications 12
Teaching Residents to Teach 14
Continuing Education Courses 15
New Surgical Oncology Chief 16
Faculty Promotions & Awards 16
New Faculty 18

On the cover, clockwise from left:
Drs. Kevin Southerland, Andrew Barbas, Nicholas Andersen,
Georgia Beasley, Michael Lidsky, David Brown, and Lola Fayanjii.
Huth Photo.
From foundational insights in endocrinology and major advances in cardiac physiology to pioneering studies in transplant and tumor immunobiology, scientific discovery has been accelerated by surgeons. Those surgeons who apply themselves to science must have dual roles, functioning both as clinically exceptional surgeons and as rigorous investigative scientists, each role requiring unique skills that are atypically developed in tandem.

Indeed, while the surgeon–scientist has always been a rare breed, the past few decades have seen a precipitous decline in their ranks driven by several factors, including decreased funding, limited time for research, increased administrative duties, and a focus on clinical productivity to the exclusion of academic achievement. This trend has also manifested among surgical trainees, reducing the likelihood of residents following a research career path.

In this issue of the Duke Surgery newsletter, we share the experiences of several of our young surgeon–scientists, highlighting the programs developed to ensure dedicated research time as they begin their investigative careers. By investing in the early stages of their careers, we can help safeguard a future with surgical insights driving transformative scientific breakthroughs.

Basic research is the foundation for medical discovery and is uniquely part of our department through the Division of Surgical Sciences. The Duke Surgery gene therapy program is a prime example of how basic and clinical research teams come together to seek improved patient outcomes. This revolutionary technology will allow surgeons to manipulate genes as well as tissues, opening opportunities unimaginable just a few years ago.

In this issue, we also examine the surgeon’s role as a leader in the community. Adolescents undergoing gender care face a unique set of challenges in the politically charged climate in North Carolina. Duke surgeons are committed to providing care and support to these patients and their loved ones, offering an option of care when limited options are available to them.

Finally, on the educational front, to prepare our trainees for careers in academic surgery, including being active participants in basic and clinical research endeavors, we need to train residents to become better mentors to medical students and junior residents.

The Teaching Scholars program provides our residents with the groundwork for mentorship that is required for success in academic surgery by preparing them to nurture upcoming surgeons.

By integrating research support and mentorship into our clinical program, we are poised to foster the next generation of investigative scientists, educators, and clinical surgeons who have the passion and desire to tackle challenges in healthcare.

Sincerely,

Allan D. Kirk, MD, PhD, FACS
David C. Sabiston, Jr. Distinguished Professor and Chairman Department of Surgery Duke University School of Medicine Surgeon-in-Chief Duke University Health System
With a buzzing phone and dinging inbox repeatedly begging for her attention, Dr. Georgia Beasley momentarily tunes out the chaos to discuss the journey that led to her current position at Duke. Here, she splits her time between treating melanoma patients in the clinic and researching novel treatments for the disease in the laboratory.

“When looking at other major centers, I saw that most of their surgeons only focused on operating,” she says. “I knew doing that wouldn’t make me the happiest. In studying cancer, everything is moving toward immune-based approaches. If I wanted to stay in surgery, especially in treating melanoma, I needed to start researching more about immunology.”

And so she did. Now an Assistant Professor of Surgery at Duke, Dr. Beasley
reconnected with the group that first introduced her to medicine 20 years ago. The team recently broke ground in using a mutated poliovirus as a therapy for recurrent glioblastoma. By triggering an immune response, the therapy causes the body to wage war on the brain tumor in the same way it would another virus. For the last year, Dr. Beasley has been testing the use of this treatment for melanoma, and she is almost ready to begin the therapy with patients.

Stories of surgeon–scientists like this one are becoming the exception. For many surgeons, time constraints, lack of funding, and pressure to increase patient volume have restricted research time to the lab years of medical training. A 2017 survey in *Annals of Surgery* revealed that only 32% of surgeons believed it was possible to be successful in basic science in today’s working environment.

Department Chair Allan D. Kirk, MD, PhD, believes this mindset to be detrimental to patient care. Due to surgeons’ close proximity to disease, they are uniquely positioned to make lasting contributions to scientific discovery through experiential expertise, which in turn will lead to improved patient care. As such, Duke is working on solutions to find equilibrium—to create a balanced system that supports its surgeon–scientists in finding success in both fields.

**OPPOSING FORCES:**
**CLINIC VS. LABORATORY**

As a surgeon–scientist in the Division of Plastic, Maxillofacial, and Oral Surgery, David Brown, MD, PhD, splits his time between navigating the figurative waters of establishing his clinical practice in regenerative medicine and wound healing, and researching in the literal waters of the Poss Lab, where he uses live imaging to study the genetic model system of zebrafish.

“Being a surgeon–scientist is a notoriously difficult career path,” Dr. Brown says. “We have to try to excel on both fronts, but especially trying to get our lab and research up and running while we are also establishing our clinical practice. It can be a pretty daunting task.”

Dr. Brown isn’t the only one feeling this pressure. The NIH confirmed through a 2014 workforce that physician–scientists are often pulled by opposing forces: one, a commitment to providing excellent clinical care, and another, a dedication
to research and scientific discovery. Surgery and research—two fields that have historically worked harmoniously to cure and prevent disease—are becoming mutually exclusive. In essence, the system is now an unbalanced equation.

Four years after the NIH’s physician–scientist report, efforts to create balance are beginning to unfold. The NIH-funded Stimulating Access to Research during Residency (StARR) R38 award supports resident–investigators on a research track over a 5-year period, and seeks to curtail the increasing numbers of physicians asked to support more of their income through clinical practice.

The NIH released ten StARR awards in 2018, with two of them awarded to Duke. Dr. David Harpole, Professor of Cardiovascular and Thoracic Surgery, is a principal investigator of a mentor team for one award, an $884,000 grant from the National Heart, Lung, and Blood Institute. He is enthusiastic that the grant will foster a successful research environment for residents.

“If you look at the advances in medicine in the last 30 years, it has mostly all been based on research supported by NIH and pharmaceuticals,” Dr. Harpole says. “If we don’t have people strengthened in medical research, we will no longer be at the forefront of innovation. Getting people who are active in surgery research doesn’t mean they are writing grants, and the R38 award will help to increase that.”

BALANCING THE EQUATION

The StARR awards are a part of a broader initiative in Duke’s School of Medicine to support physician–scientists, a cause Dean Mary E. Klotman fully stands behind. In addition to seeking out funding opportunities, a new Office for Physician–Scientist Development is in the works, with a goal to recruit and mentor clinicians who wish to continue research.

“Duke’s receipt of these important awards and establishment of this new office will catapult our ongoing efforts to encourage and help develop more physician–scientists, the number of which has been steadily decreasing,” says Dean Klotman. “Physician–scientists bring a knowledge of both laboratory and clinical research that is essential for translating discovery.”

In order to cultivate a system of support for its scientists within the department,
Duke Surgery first needs a faculty with a strong penchant for research, a quality high on the list in recent recruiting efforts.

Four of the department’s newest faculty will develop their clinical practice while also enjoying protected time in the laboratory, a privilege many academic healthcare systems have begun to retract. These new faculty and their research interests are listed to the left.

FORMING STRONGER BONDS

While recruiting research-oriented faculty is important, providing support for new and existing surgeon–scientists in our department is integral to their success. To do so, the department has formed a small cohort of faculty across multiple specialties, a collaboration that allows its members to share ideas, give feedback, and support one another as they balance the equally demanding roles of surgeon and scientist.

As part of the cohort, junior faculty will work with mentors who have excelled in research, including Vice Chair of Research and Professor of Surgery Shelley Hwang, MD, MPH.

“Duke’s surgeon–scientists are essential to moving our field into the future,” Dr. Hwang says. “One of our key missions is to guide and support them with the clear intent of ensuring their success. I am proud to be in one of the few surgery departments in the country that prioritizes growing this critical pipeline.”

As a member of the cohort, abdominal transplant surgeon Andrew Barbas, MD, says bringing together faculty from both sides of the fence is a rare opportunity. “Dr. Kirk and Dr. Hwang have long distinguished careers in clinical work and laboratory-based investigation,” he says. “We all work in different areas, but there are some common themes, tools, and techniques that might be helpful across disciplines. That exposure is helpful.”

Even for non-traditional scientists, the cohort provides meaningful support. Assistant Professor of Surgery Oluwadamilola Fayanju, MD, MA, MPHS, works in health services to reduce disparities in breast cancer care, but her focus on big data analysis to improve care requires a great deal of research time outside of the clinic. She is grateful to be part of a department that allows her to pursue these interests passionately.

“I’m excited to be at Duke because of the many research resources that exist here,” Dr. Fayanju says.

“We have great mentorship in Dr. Kirk and Dr. Shelley Hwang, and now Dr. Peter Allen joining us as the chief of Surgical Oncology. These are world-renowned researchers, and having leadership that is so strongly aligned with the scientific mission makes it easier for us younger faculty to pursue that, and to be passionate about it. We can focus on furthering the scientific fields that we are in, while also providing excellent care to our patients.”

FALLING INTO PLACE

During their first meeting in July 2018, Dr. Kirk’s initial talk included a comedic metaphor about the role of a surgeon–scientist, but one that resonated with Dr. Brown. “Being a surgeon–scientist is a lot like playing a game of Tetris,” he recalls from Dr. Kirk’s message. “All of the pieces have to fit together. You have to rotate them into position, and you can’t stop them from dropping no matter what. If you don’t get it all just right, your work continues to build up. As you progress, things get harder, not easier, and everything comes at you faster. The reward for playing the game—it’s that you get to keep playing.”

For our successful surgeon–scientists—those who have found the balance between exceptional care for patients today, and research that will help innumerable patients tomorrow—that reward is enough to keep playing the game.

For an insider’s look at the research of the department’s newest surgeon–scientists, look for an upcoming web series starting in November 2018, at surgery.duke.edu/news-recognition.
Surgeons frequently influence medical decisions with their novel discoveries and improvements to procedures. Occasionally, the scope of practice extends beyond the walls of the operating room and into the national spotlight of political and social sciences, allowing surgeons to take up a visible position of leadership in the community.

One such opportunity arose within Duke Children’s Hospital in 2015, when Deanna Adkins, MD, founded the Center for Child and Adolescent Gender Care—the first of its kind in North Carolina. Just one year later, the NC House Committee held a special session to pass HB2, which eliminated antidiscrimination protections for LGBTQ individuals and legislated that in government buildings, individuals may only use restrooms and changing facilities that correspond to the sex on their birth certificates.

Associate Professor of Surgery Jonathan Routh, MD, the Pediatric Urologist for the clinic since its inception, frequently treats patients who come in with urological issues caused by “waiting too long to use the bathroom, because they are afraid of being beaten up by their classmates for using the ‘wrong’ bathroom.” Due to situations like these, Routh has become more politically outspoken in this role than he would be under different circumstances.

The Center serves two discrete populations, with the majority being transgender children and teens, “the kids who come in saying ‘no, I’m a boy’ with certainty,” and a smaller group, who are born with differences in sex development (DSD), which is Routh’s area of specialty. DSD is a term used to collectively refer to medical conditions that involve atypical reproductive system development.

For transgender youth, the Center talks them through their medical options, supporting them socially and psychologically. “We can hit the pause button on puberty,” Routh says, explaining that they use hormone blockers to prevent the development of secondary sex characteristics, “giving patients and their families breathing room to process and come to terms with what they really want.”

For patients with DSD, decisions become more complicated. Legally, parents can make decisions regarding their children, but many groups, such as the Intersex Justice Project and the Human Rights Watch, advocate complete bans on all gender surgeries on minors. This generation of adults was “deeply affected and hurt by procedures performed 30 years ago,” Routh says. It was a time before the medical community gained a more nuanced understanding of these issues and physicians began specializing in pediatric urology. Because DSD affects a diverse population, and has a variety of underlying causes, “one-size-fits-all pronouncements tend to be problematic.”

Duke adheres to the current best practice of performing DSD surgeries at age 6–18 months, if and only if medically necessary. Parents find themselves in the positions of needing to “make guesses on what their child, as a future sexual being, would want,” a difficult scenario for most parents to process. This is why Routh promotes team-based care, which looks to treat the family as a unit while putting the child’s needs first.

“We really try to have a considered and conscientious approach,” he
On April 18, 2018, perioperative teams from the Duke University Health System gathered for the 1 Duke Periop event at Cameron Indoor Stadium with guest speaker Coach Mike Krzyzewski. The event celebrated an initiative to create a new perioperative culture at Duke Health to enhance patient care while also improving the way perioperative teams work together. Team members from Duke University Hospital, Duke Raleigh Hospital, Duke Regional Hospital, Davis Ambulatory Surgical Center, Duke Ambulatory Surgery Center, and Duke Eye Center attended the event.

Dr. Allan Kirk, Surgeon-in-Chief for the Duke University Health System and Chair of the Department of Surgery, spoke about the importance of team members caring for each other. “We deliver outstanding perioperative care every day,” Dr. Kirk said. “What we are here for today is to rededicate ourselves as a team to our whole mission taking care of our patients, taking care of their families, but more importantly, taking care of each other so that we do those other two missions.”

Coach Krzyzewski delivered an inspirational message of creating a championship-level culture based on communication, trust, collective responsibility, care, and pride. The legendary basketball coach shared his experiences coaching the Duke Men’s Basketball team and the USA Men’s Basketball team and discussed how the periop teams can apply a similar culture to produce success in the operating room.

“This is Cameron Indoor Stadium's best moment.”

– Coach Mike Krzyzewski

The clinic is currently open 2–3 days a month, and their waiting list is usually 6–9 months. Kristen Rezak, MD, who will join Duke in September, specializes in breast reconstruction surgery and will be a welcome addition to the team. Going forward, Routh would also like to have a social worker on staff during all clinic hours, and he is currently working with the World Professional Association for Transgender Health to understand what might be needed in order for the Center to be able to extend their services to adult transgender patients as well.

“We’ve really tapped into something here; these kids aren’t getting this kind of support from anywhere else.”
Gene therapy and gene editing platforms, such as the breakthrough technology CRISPR, have the potential to revolutionize medicine. The ability to hack into DNA and alter the genetic code to fix genetic defects opens up a new world of therapeutic applications. In the future, gene editing may help treat some of the most devastating diseases and genetic disorders facing humans.

Duke Surgery researchers are now using gene therapy and gene editing in basic research studies to evaluate potentially groundbreaking therapies for cancer, infectious disease, and transplantation.

Dawn Bowles, PhD, Assistant Professor in Surgery, Division of Surgical Sciences, in collaboration with Carmelo Milano, MD, Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, and Muath Bishawi, MD, MPH, Cardiothoracic Surgery Resident, are turning to gene therapy to improve patient outcomes following heart transplantation.

“There are still numerous negative outcomes in heart transplantation even though it’s the gold standard treatment for end-stage heart failure,” says Dr. Bowles. “Preventing organ rejection or preventing the extreme need for immunosuppression are some of the goals that we’re currently working on.”

Dr. Bowles’ team is interested in using recombinant viral vectors to deliver therapeutic genes inside the heart. These non-pathogenic viruses go door-to-door, delivering immune-altering genes to cells. Like a light switch, the genes can turn immune responses on or off. However, a successful therapy must be targeted to specific organs or tissues to avoid inadvertently triggering a detrimental immune response in other parts of the body.

Using an adeno-viral vector with a luciferase indicator gene that lights up when expressed, Dr. Bowles’ team can see if the gene is localized in the heart or dispersed throughout the body. So far, this gene delivery technology has worked. The Duke Surgery team is now the first in the United States to successfully express genes in hearts using an animal model and ex vivo perfusion, a method of keeping an organ alive outside of the body.

“We’re documenting what we’re considering unprecedented global transgene expression throughout the entire heart and nowhere else in the body, which makes this approach very safe,” explains Dr. Bowles. “We feel that this is transformative because using other ways of delivering viral vectors in vivo, no one has been able to achieve what we’ve been able to achieve.”

Dr. Bowles says the next step in organ preservation is looking at cryopreserving organs to allow more time for donor matching and organ assessment. Gene therapy could be used to repair any damage done during the preservation...
process. She thinks CRISPR could ultimately be used to modify organs so that the antigenicity of the organ is hidden from the immune system. Cloaking an organ in an immune-altering gene could trick the body into accepting the donor organ as one of its own. This would eliminate the need for patients to take long-term immunosuppressants with toxic side effects.

With a renewed focus on using gene therapy to improve patient health, Duke Surgery recently recruited Aravind Asokan, PhD, Professor of Surgery, Division of Surgical Sciences, as Director of Gene Therapy. Dr. Asokan and his team have developed gene therapy and gene editing platforms using recombinant adeno-associated viruses to deliver therapeutic DNA to tissue and cells in preclinical animal models and patients with cancer, heart failure, muscular dystrophy, and other neuropahties.

“The broad overarching goal of the lab is to engineer viruses as tools that can enable gene editing and gene therapy platforms or modalities to move to the clinic,” says Dr. Asokan. “What that really leads to is a platform technology where you can see tailoring these delivery vehicles to target organs of interest and to match those with specific disorders and diseases.”

In partnership with Ken Poss, PhD, Director of Regeneration Next, Dr. Asokan will focus on enabling tissue regeneration to “teach the body to heal.” Gene therapy can improve wound healing for failing organs, paving the way for researchers to repair organs outside of the body by regenerating organ tissue in the lab, while surgeons reimplant the repaired organ, known as autotransplantation. In another approach, viruses would be used to deliver genetic cargo to help reprogram failing organs to heal. To overcome the organ shortage, someday researchers can grow an organ in the lab using a patient’s own cells so their immune system does not reject it.

“You have clinicians on one end in the surgery space and folks like Ken and others who are in the regeneration space, so bridging that basic science with the transformational clinical science is right where we are, in that grey zone, so that’s what makes this really exciting,” says Dr. Asokan.

In the future, rather than wait for a transplant, patients in need of organs can simply visit their doctor’s office and have a custom-made organ ready for transplantation. While this medical frontier may seem far off, Duke Surgery researchers are looking to make this a reality.

of Emergency Medicine, received an award from Vanderbilt University Medical Center for “CCC for NHLBI Prevention and Early Treatment of Acute Lung Injury (PETAL Network – CLOVERS).” Additionally, Dr. Limkakeng received an award from AstraZeneca AB for “Energize.”

Michael E. Lipkin, MD, Associate Professor of Surgery, Division of Urology, received an award from Allena Pharmaceuticals for “Evaluate the Safety and Efficacy of ALLN-177 in Patients with Enteric Hyperoxaluria: A Phase III Randomized, Placebo-Controlled Study.”

Carmelo A. Milano, MD, Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received an award from Medtronic, Inc., for the “TVVAD Study.”

Kadiyala V. Ravindra, MBBS, Associate Professor of Surgery, Division of Abdominal Transplant Surgery, received an award from Medeor Therapeutics, Inc., for “MDR 101-MLK.”

Jacob N. Schroder, MD, Assistant Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received an award from Vascular Graft Solutions, Inc., for “Study of the Safety and Effectiveness of VEST, Venous External Support.”

John S. Wiener, MD, Professor of Surgery, Division of Urology, received an award from Astellas Pharma, Inc., for “Crocodile.”
Dawn E. Bowles, PhD, Assistant Professor in Surgery, Division of Surgical Sciences, received a grant from 3R Life Sciences Taiwan, Ltd., for “Cadaver Implant Studies of PABP.” Additionally, Dr. Bowles received a grant from the North Carolina Biotechnology Center for “Expanding the Capabilities and Utilization of the Duke Human Heart Repository.”

Chin Ho Chen, PhD, Professor of Surgery, Division of Surgical Sciences, received a grant from the National Institutes of Health for “Small Molecule HIV-1 Entry Inhibitor with Novel Mechanisms of Action.”

Mani A. Daneshmand, MD, Assistant Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received a grant from Mallinckrodt Pharmaceuticals for “XVIVO Lung Clinical Research.”

Guido Ferrari, PhD, Associate Professor of Surgery, Division of Surgical Sciences, received a grant from the University of North Carolina at Chapel Hill for “CARE Duke–UNC Latency Biomarker Supplement Year 2.”

Zachary C. Hartman, PhD, Assistant Professor of Surgery, Division of Surgical Sciences, received a grant from the Department of Defense for “A Neoeptipe Subunit Vaccine Targeting the Mutated Estrogen Receptor Ligand Binding Domain to Treat and Prevent Endocrine-Resistant ER+ Breast Cancer.”

Shelley Hwang, MD, MPH, Professor and Vice-Chair of Research, Division of Surgical Oncology, received a grant from the University of California at San Francisco for “Tissue Tension, RANK and Breast Cancer Risk.” Additionally, Dr. Hwang received a grant from MD Anderson Cancer Center for “Prevent Ductal Carcinoma In Situ Invasive Overtreatment Now – PRECISION” and a grant from the Alliance for Clinical Trials in Oncology Foundation for “CALGB 40903.”

Allan D. Kirk, MD, PhD, Professor and Chair, Department of Surgery, received an NIH subaward from Stanford University for “The Impact of Epstein–Barr Virus Infection on the Immune Response in Pediatric Transplant Recipients.”

Stuart J. Knechtle, MD, Professor of Surgery, Division of Abdominal Transplant Surgery, received a grant from CareDx, Inc., for “Evaluation of Patient Outcomes From the Kidney Allograft Outcomes Allosure Registry (KOAR) Agreement.”

Walter T. Lee, MD, Associate Professor of Surgery, Division of Head and Neck Surgery & Communication Sciences, received a grant from Vigilant Biosciences for “Clinical Evaluation of the OncAlert RAPID in Subjects Presenting for Evaluation and/or Initial Biopsy.”

Michael E. Lipkin, MD, Associate Professor of Surgery, Division of Urology, received a grant from Boston Scientific Corporation for “Clinical Parameter Consistency in Single-Use Ureteroscopes: Comparison of the Boston Scientific Lithovue to the Pusen Single-Use Ureteroscope.”

David C. Montefiori, PhD, Professor of Surgery, Division of Surgical Sciences, received a grant from the National Institutes of Health for the “Nonhuman Primate Core.”

Sean P. Montgomery, MD, Assistant Professor of Surgery, Division of Trauma and Critical Care Surgery, received a grant from Kitware, Inc., for “Slicer+PLUS: Collaborative, Open-Source Software for Ultrasound Analysis.”

Henry E. Rice, MD, Professor and Chief, Division of Pediatric General Surgery, received a grant from the National Institutes of Health for “Implementation of a Safety Program in Guatemala.”

Kristal M. Riska, AuD, PhD, Assistant Professor of Surgery, Division of Head and Neck Surgery & Communication Sciences, received a grant from Mountain Home Research & Education Corporation for “Factors Associated With Outcomes in Patients with Vestibular Symptoms Related to Traumatic Brain Injury.”

Debra L. Sudan, MD, Professor and Chief, Division of Abdominal Transplant Surgery, received a grant from Shire Pharmaceutical Development US, Inc., for “Short Bowel Syndrome Registry.” Additionally, Dr. Sudan received a grant from Plexision, Inc., for “Immune Function and Transplant Outcomes.”

Bruce A. Sullenger, PhD, Professor of Surgery, Division of Surgical Sciences, received a grant from the National Institutes of Health for “Engineering Polymers to Scavenge DAMPs in Arthritis and Lupus.” Additionally, Dr. Sullenger received grants from EpiCypher, Inc., for “Aptamer Beacons for Epigenetic High-Throughput Assay Development” and “Next-Generation Detection Reagents for Chromatin Immunoprecipitation.”

Georgia D. Tomaras, PhD, Professor in Surgery, Division of Surgical Sciences, received a grant from GlaxoSmithKline for “PRO HIV-013 Humoral Immune Response.”

Elisabeth T. Tracy, MD, Assistant Professor of Surgery, Division of Pediatric General Surgery, received a grant from Main Line Health for “2017/2018 Health Career Academy Program Grant.”

David L. Witsell, MD, Professor of Surgery, Division of Head and Neck Surgery & Communication Sciences, received a grant from Olympus Corporation for “Leveraging Real-World Evidence to Understand Contemporary Medical and Surgical Care.”
PUBLICATIONS IN HIGH IMPACT FACTOR JOURNALS*

Adjuvant chemotherapy guided by a 21-gene expression assay in breast cancer.

Anticoagulation and antiplatelet strategies after On-X mechanical aortic valve replacement.

Combination of aptamer and drug for reversible anticoagulation in cardiopulmonary bypass.

Efficacy of high-sensitivity troponin T in identifying very-low-risk patients with possible acute coronary syndrome.

Functional relevance of improbable antibody mutations for HIV broadly neutralizing antibody development.

HCMV glycoprotein B subunit vaccine efficacy mediated by nonneutralizing antibody effector functions.

HIV vaccine candidate activation of hypoxia and the inflammasome in CD14<sup>(+)</sup> monocytes is associated with a decreased risk of SIV<sub>(mac251)</sub> acquisition.

A human monoclonal antibody prevents malaria infection by targeting a new site of vulnerability on the parasite.

Management considerations in infective endocarditis: A review.

Paracrine Wnt5a-β-catenin signaling triggers a metabolic program that drives dendritic cell tolerization.

Quality of care for veterans with transient ischemic attack and minor stroke.

Radiographic progression-free survival as a clinically meaningful end point in metastatic castration-resistant prostate cancer: The PREVAIL randomized clinical trial.

Recurrent glioblastoma treated with recombinant poliovirus.

S-nitrosylation of β-arrestins biases receptor signaling and confers ligand independence.

Seizure rates in enzalutamide-treated men with metastatic castration-resistant prostate cancer and risk of seizure: The UPWARD study.

Spatial mutation patterns as markers of early colorectal tumor cell mobility.
Ryser MD, Min BH, Siegmund KD. *Proc Natl Acad Sci USA.* 2018;115(22):5774-5779.


Tandem bispecific broadly neutralizing antibody – a novel approach to HIV-1 treatment.

Tracking HIV-1 recombination to resolve its contribution to HIV-1 evolution in natural infection.

Tunable cytotoxic aptamer-drug conjugates for the treatment of prostate cancer.

Two-year outcomes with a magnetically levitated cardiac pump in heart failure.

*Journals with an Impact Factor greater than 10.0*
A new teaching program prepares residents for a career in academic surgery

Academic surgery requires an innovative environment to rigorously address evolving challenges in patient care, while nurturing the next generation of surgeon–scientists to overcome future obstacles. At its core is a deep commitment to education.

“The ideal that gets mentioned for academic surgery is the triple threat: being technically excellent and busy clinically, a productive researcher and an independent investigator, and an involved and capable teacher to both residents and medical students,” says Dr. Brian Gilmore, PGY-5 General Surgery Resident.

“Surgery residency provides the clinical training to become an excellent surgeon and at institutions that focus on research, such as Duke, there is a big effort to ensure that we graduate as independent research investigators, but generally in medicine, and surgery is no exception, there is very little done to teach you how to teach.”

The Duke Department of Surgery recently introduced the Sabiston Teaching Scholars Program for General Surgery Residents, a unique training opportunity for residents interested in an educational career path. In addition to Dr. Gilmore, Drs. Soni Nag, Morgan Cox, Brian Ezekian, Cecilia Ong, and Megan Turner have served as Teaching Scholars over the past two years.

As Teaching Scholars, the residents mentor medical students during their 8-week surgery clerkship, at times serving as lecturers and leading small group sessions on specific surgical topics. Additionally, the residents teach surgical skills sessions, including basic knot tying, laparoscopy, tubes, lines, and drains, and accompany the students on physical exam rounds.

“In a sense, you’re actually playing the role of a camp counselor,” says Dr. Gilmore. “It’s an awesome experience. You really get to know the group of students you’re embedded with.”

While providing mentorship to medical students during their clinical rotations, the residents also act as liaisons for students interested in research projects in the Department of Surgery. Throughout the duration of the program, the residents are available to answer the students’ questions at all hours of the day. The program ultimately aims to improve student satisfaction and to reduce instances of student mistreatment.

For Chloe Peters, third-year medical student, surgery was her first rotation and she was nervous about starting her clerkship. “Regardless of how kind program directors may be, it is always easier to approach a resident, especially one you are not working with on the wards, with any questions or concerns,” she says. “Dr. Gilmore provided an unwavering source of encouragement.
The U.S. News and World Report has ranked the Duke University School of Medicine 5th in surgery among the best medical schools in the country. Rankings are based on reputation and statistical data regarding the quality of the school’s research, faculty, and students. The data were obtained from statistical surveys sent to more than 2,012 programs and from reputation surveys sent to more than 20,500 academics and professionals.

**DUKE MEDICAL SCHOOL RANKS 5TH IN SURGERY**

**DUKE SURGERY ADVANCED EDUCATION COURSES**

For a complete list of courses, please visit innovation.surgery.duke.edu/courses.

**Duke Solid Organ Transplant Summit**
October 6, 2018
Durham, North Carolina

**Duke Tuesday in Urology**
November 6, 2018
Durham, North Carolina

**Duke Tuesday in Urology**
February 19, 2019
Durham, North Carolina

**51st Duke Urologic Assembly and Urologic Cancer Symposium**
March 28–31, 2019
Lake Buena Vista, Florida

**Duke Masters of Minimally Invasive Thoracic Surgery**
October 10–12, 2019
Orlando, Florida

Dr. Gilmore says the greatest payoff is seeing the students he mentored choose surgery for their careers. “It’s really rewarding to have students you taught come back to you to talk about their career plans, particularly when those are individuals who weren’t necessarily interested in surgery prior to their clerkship. It allows me to fill a role that some of the most influential figures in my own career did and to pay it forward, but to do it in a structured and sustainable way.”

General Surgery Residents Joshua Watson, Justin Barr, Carrie Moore, Whitney Lane, John Yerxa, and Zachary Fitch will serve as Teaching Scholars for the coming year.

Above: Teaching Scholar and General Surgery Resident Brian Gilmore, MD, leads a skills session.
DUKE SURGERY APPOINTS NEW CHIEF OF SURGICAL ONCOLOGY

Duke Surgery is pleased to announce the appointment of Peter J. Allen, MD, as the new Chief of the Division of Surgical Oncology in the Department of Surgery and Chief of Surgery for the Duke Cancer Institute (DCI).

Dr. Allen comes to Duke from the Memorial Sloan Kettering Cancer Center where he served as the Murray F. Brennan Chair in Surgery and Vice Chair of Surgical Services. His other roles have included Associate Director for Clinical Programs at the David Rubenstein Center for Pancreatic Cancer Research and Professor of Surgery at Weill Medical College of Cornell University.

“Dr. Allen brings outstanding leadership capabilities, superb surgical skills, and impressive research productivity,” says Allan D. Kirk, MD, PhD, Chair of the Department of Surgery. “He is the perfect addition to an already strong surgical oncology program.”

“In assuming the critically important roles of Chief of Surgery for the DCI and Chief of the Division of Surgical Oncology, Dr. Allen will work closely with physician and administrative leaders throughout Duke Health, the DCI, and numerous clinical departments to help ensure delivery of quality surgical care and research for all Duke patients,” says Michael B. Kastan, MD, PhD, Executive Director of the DCI.

Dr. Allen graduated from Harvard University in 1989 and received his medical degree from Dartmouth Medical School in 1993. He went on to complete his surgical residency at the Walter Reed Army Medical Center in 1999. He finished a research fellowship in the hepatic oncology laboratory at the Memorial Sloan Kettering Cancer Center in 1997, followed by a clinical fellowship in surgical oncology in 2003. Prior to his return to Memorial Sloan Kettering in 2005, Dr. Allen served as a surgical oncologist at Walter Reed and was deployed to Iraq for one year as a member of the 2nd ACR forward surgical team.

Dr. Allen is board certified in surgery and specializes in treating cancerous and precancerous conditions of the pancreas, liver, bile duct, and stomach. His research focuses on developing nonsurgical methods for diagnosing pancreatic cancer, including the identification of novel biomarkers and imaging modalities for patients with precancerous conditions of the pancreas. He has led multiple prospective trials, and his research has been funded by the NIH since 2009.

He is a fellow of the American College of Surgeons and a member of the Society of Surgical Oncology and the American Surgical Association among many other professional memberships. He currently serves on the Editorial Boards for *Annals of Surgery, Annals of Surgical Oncology, Journal of Gastrointestinal Surgery*, and *HPB*.

Dr. Allen took over the reins as Division Chief from Dr. Ted Pappas. Says Dr. Kirk, “Dr. Pappas has built a renowned surgical oncology program as demonstrated by the recruitment of such a luminary candidate as Dr. Allen.”

“It is an honor to join the Department of Surgery at Duke University,” says Dr. Allen. “The reputation of the Department is surpassed by none, and the surgeons within the Division of Surgical Oncology are clearly talented. I believe over the next five years we can capitalize on the Division’s momentum and become national leaders in the three areas of clinical care, research, and education.”

His arrival coincides with the launch of a new division title, which will change from “Advanced Oncologic and Gastrointestinal Surgery” to “Surgical Oncology.”
FACULTY AWARDS

SHELEHY HWANG, MD, MPH
Vice Chair of Research and Chief of Breast Surgery, was accepted as a fellow in the Hedwig van Ameringen Executive Leadership in Academic Medicine Program.

HENRY E. RICE, MD
Professor and Chief of Pediatric General Surgery, received the 2018 Leonard Tow Humanism in Medicine Award. This award is presented annually to a Duke faculty member who embodies compassion, sensitivity, respect for patients and colleagues, and clinical excellence.

ANDREW BARBAS, MD
Assistant Professor of Surgery, Division of Abdominal Transplant Surgery, received a Duke Strong Start New Physician–Scientist Award. The award supports outstanding lab-based clinician–scientists.

SREEJA NATESAN, MD
Assistant Professor of Surgery, Division of Emergency Medicine, received the Council of Emergency Medicine Residency Directors’ Academy Scholar Award in the category of Teaching and Evaluation.

JOHN C. HANEY, MD, MPH
Assistant Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received the D. Dwight C. McGoon Award from the American Association for Thoracic Surgery.

CYNTHIA SHORTELL, MD
Professor and Chief of Vascular and Endovascular Surgery, was named Chair-Elect of the Guidelines Committee for the American Venous Forum.

CONRAD SUDAN, MD
Professor and Vice Chair of Education, was named President-Elect of the Clinical Robotic Surgery Association.

LINDA CENDALES, MD
Associate Professor of Surgery, Division of Plastic, Maxillofacial, and Oral Surgery, was appointed Co-Chair of the American Transplant Congress Planning Committee by the American Society of Transplant Surgeons.

PAUL MOSCA, MD, PhD
Associate Professor of Surgery, Division of Surgical Oncology, received the Duke University School of Medicine’s Master Clinician / Teacher Award for 2018.

ANDREW J. LODGE, MD
Associate Professor of Surgery, Division of Cardiovascular and Thoracic Surgery, received a Presidential Award for distinguished service. One of the highest honors at Duke, the award recognizes those who have made distinctive contributions to Duke within the past year.

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GEORGIA TOMARAS, PhD
Professor in Surgery, Division of Surgical Sciences, was named Co-Chair of the 2018 HIV Research for Prevention (HIVR4P 2018) conference.
NEW FACULTY

PRIYAMVADA ACHARYA, PhD
Associate Professor of Surgery, Division of Surgical Sciences
Research interests include deciphering the mechanism of HIV-1 viral entry and utilizing this knowledge for vaccine and therapeutic development. Dr. Acharya’s lab uses structural biology methods, including x-ray crystallography and cryo-EM, to visualize entry intermediates.

NICHOLAS ANDERSEN, MD
Assistant Professor of Surgery, Division of Cardiovascular and Thoracic Surgery
Research interests include discovering new treatment options for single ventricle heart disease, including using molecular biology to stimulate heart muscle growth, and using thymic transplants to improve immunoresponse after cardiac transplant.

ARAVIND ASOKAN, PhD
Professor of Surgery, Division of Surgical Sciences
Research interests include building innovative technology platforms for gene therapy, regulation, and editing. His lab utilizes structural biology, protein engineering, and directed evolution to generate synthetic viral vectors for gene transfer, and engineering RNA for precise spatiotemporal control of gene expression.

CATHLEEN BURY, MD
Assistant Professor of Surgery, Division of Emergency Medicine
Clinical interests include emergency medicine.

ALISSA COLLINS, MD
Assistant Professor of Surgery, Division of Head and Neck Surgery & Communication Sciences
Clinical interests include the medical and surgical management of voice, airway, and swallowing disorders, such as hoarseness, benign and malignant vocal fold lesions, vocal fold paralysis, spasmodic dysphonia, laryngeal and tracheal stenosis, and dysphagia. Research interests include neurolaryngology and tissue regeneration in airway stenosis.

DANIEL BUCKLAND, MD, PhD
Assistant Professor of Surgery, Assistant Professor of Mechanical Engineering and Materials Science, Division of Emergency Medicine
Clinical interests include emergency medicine. Dr. Buckland directs a laboratory in the Duke Robotics group focused on medical device development for remote environments, such as rural health and human spaceflight.

BRENDA FLANAGAN, MD
Assistant Professor of Surgery, Division of Emergency Medicine
Clinical interests include emergency medicine.
SOPHIE GALSON, MD
Assistant Professor of Surgery, Division of Emergency Medicine
Research interests include hypertension in the emergency department and linkage to care in Moshi, Tanzania. Dr. Galson is interested in the intersection of public health, non-communicable diseases, and emergency care, and she hopes to promote the development of emergency medicine globally.

KEVIN GURYSH, MD
Assistant Professor of Surgery, Division of Emergency Medicine
Clinical interests include the stabilization and treatment of emergent medical conditions and shock states, such as sepsis, cardiopulmonary diseases, vascular diseases, and trauma. Research interests include improving patient care in the emergency department using point-of-care, focused ultrasonography.

KRISTA L. HAINES, DO
Assistant Professor of Surgery, Trauma and Critical Care Surgery
Clinical interests include critical care, palliative care, trauma, and emergency surgery. Research interests include healthcare disparities and medical ethics.

ANJINI JOINER, DO
Assistant Professor of Surgery, Division of Emergency Medicine
Clinical and research interests include education and critical care, spinal cord injuries and shock, peri-mortem C section, and obstetric emergencies.

HARAMOL S. GILL, MD
Assistant Professor of Surgery, Division of Emergency Medicine
Clinical and research interests include education and critical care, spinal cord injuries and shock, peri-mortem C section, and obstetric emergencies.

MICHAEL LIDSKY, MD
Assistant Professor of Surgery, Division of Surgical Oncology
Clinical interests include management of pre-cancerous and cancerous conditions of the liver, bile ducts, and pancreas. Dr. Lidsky's research uses a pre-clinical model for primary hepatic malignancies to recapitulate critical signaling and regulatory events, facilitating the identification of mechanisms driving tumorigenicity and chemoresistance, and serving as a vehicle for the discovery of novel therapeutic targets.

KEVIN SOUtherLAND, MD
Assistant Professor of Surgery, Division of Vascular and Endovascular Surgery
Research interests include examining characteristics of skeletal muscle and satellite muscle stem cells to determine new treatment options for blockages and peripheral artery disease.

BRETT PHILLIPS, MD
Assistant Professor of Surgery, Division of Plastic, Maxillofacial, and Oral Surgery
Clinical interests include oncologic microsurgical reconstruction and dynamic and static facial reanimation procedures. Research interests include surgery outcomes, standardization of definitions and outcome reporting, treatment of skin necrosis using minimally invasive techniques, and quantitative and qualitative tissue perfusion analysis.

ANJNI JOINER, DO
Assistant Professor of Surgery, Division of Emergency Medicine
Clinical interests include reducing sepsis mortality by employing prehospital sepsis recognition and treatment initiatives. Research interests include injury prevention and global health, specifically focusing on traumatic brain injuries and road traffic injuries, and researching the impact of climate change on the provision of prehospital care in Swaziland.

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MISSION
Through sustainable, multidisciplinary teams we:

- Provide insight regarding the fundamental nature of patient health and disease
- Empower all patients, trainees, and colleagues with knowledge
- Provide safe and high-quality care based on an advanced understanding of and respect for our patients’ needs and guided by best practices

VISION
Duke Surgery: United, for All Patients

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A gift to the Duke Department of Surgery is a gift of knowledge, discovery, and life. Every dollar is used to further our understanding of surgical medicine, to develop new techniques, technology, and treatments, and to train the surgeons and researchers of the future.

If you would like to make a philanthropic investment in Duke Surgery, please contact Marcy Romary, Senior Major Gifts Officer, with Duke Health Development and Alumni Affairs at marcia.romary@duke.edu or visit surgery.duke.edu/gift.

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