CROSS-INSTITUTIONAL
By bridging Duke’s schools, centers and institutions, the Department of Medicine extends its reach not only across campus but around the globe and deeper into science.

MULTI-DISCIPLINARY
By fostering opportunities across our 13 divisions, we support physicians and investigators working together at the frontiers of medicine.

TEAM-FOCUSED
By facilitating team science and career mentoring, we promote the idea that together we propel medical knowledge further.
Since 1930, the Department of Medicine has forged vital partnerships to advance research, patient care and medical education at Duke University.

1930
The Duke University School of Medicine, Duke University Hospital and the Department of Medicine were established. Harold Amoss, MD, became the first department chair and in 1931 welcomed three internal medicine residents.

1937
Duke established the nation’s first brain tumor program, opened the Duke Comprehensive Cancer Center in 1971 and developed the nation’s first outpatient bone marrow transplantation program in 1992.

1955
The Duke University Center for Aging was established and pioneered long-term studies of health problems among the elderly. Now, renamed the Center for the Study of Aging and Human Development, it’s 125 faculty and staff conduct age-related research, garnering more than $20 million in annual funding. Harvey Cohen, MD, former chair, leads the center.

1950
Grace Kerby, MD, served as the first female chief resident in the Internal Medicine Residency Program. In 1966, Kerby became the first female division chief (Rheumatology) and the first woman to reach the rank of professor. Today, women make up 36% of Medicine faculty and 45% of Internal Medicine residents.

1955
The Duke University Center for Aging was established and pioneered long-term studies of health problems among the elderly. Now, renamed the Center for the Study of Aging and Human Development, its 125 faculty and staff conduct age-related research, garnering more than $20 million in annual funding. Harvey Cohen, MD, former chair, leads the center.

1966
Kerby became the first female division chief (Rheumatology) and the first woman to reach the rank of professor. Today, women make up 36% of Medicine faculty and 45% of Internal Medicine residents.

1969
Eugene Stead, MD, chair of the department, and creator of the first Physician Assistant program, established the Duke Databank for Cardiovascular Diseases, which became one of the world’s largest repositories of follow-up on patients with coronary heart disease. The Duke Clinical Research Institute grew out of the databank to conduct innovative, multicenter clinical research. Robert Califf, MD, served as the first DCRI director.

1971
Deborah Kerby, MD, served as the first female Residency Program director. In 1966, Kerby became the first female division chief (Rheumatology) and the first woman to reach the rank of professor. Today, women make up 36% of Medicine faculty and 45% of Internal Medicine residents.

1974
Wendell Rossie, MD, professor of medicine (Hematology), founded the Duke Sickle Cell Center. It was designated a NIH Comprehensive Sickle Cell Center in 1986 to serve patients throughout North Carolina. The center’s large portfolio of research studies includes the Cooperative Study of Sickle Cell Disease to better understand the natural history of the disease and the Multicenter Study of Hydroxyurea, which led to the only FDA-approved drug for sickle cell disease. Marilyn Teilen, MD, professor of medicine (Hematology), became director in 1996.

2002
The Duke Institute for Genome Sciences and Policy was founded. It represents Duke’s comprehensive response to the broad challenges of the genomic revolution and includes 14 faculty from the Department of Medicine.

2005
Duke University and National University of Singapore established Duke-NUS Graduate Medical School Singapore, designed to produce highly trained medical leaders and cross-institutional research collaborations. Barton Haynes, MD, former chair, was chosen by the NIH to lead the $300-million Center for HIV/AIDS Vaccine Immunology (CHAVI), a consortium dedicated to solving major problems in HIV vaccine development and design. In 2012, NIH awarded the follow-up CHAVI-ID grant to Duke and Scripps Research Institute to continue with immunogen discovery.

2013
Vance Fowler, MD, professor of medicine (Infectious Diseases), was awarded a $62-million grant to establish the Duke O’Brien Center for Kidney Research, to support research on the connection between kidney and cardiovascular diseases.

2010
Mary Klotman, MD, is the first woman to become chair of the Department. She earned her undergraduate and medical degrees at Duke and completed her internal medicine residency and fellowship in Infectious Diseases, then spent 23 years at the NIH and Mount Sinai School of Medicine before returning to North Carolina.

2012
Thomas Coffman, MD, chief of the Division of Nephrology, was awarded a five-year, $5.8-million grant establishing the Duke O’Brien Center for Kidney Research, to support research on the connection between kidney and cardiovascular diseases.

2006
Duke launched the Global Health Institute to promote education, research and service in health care to underserved populations around the world. Among its faculty are 11 from Medicine. In 2013, the Duke Hubert-Yeargan Center for Global Health helped open Western Kenya’s first cardiac care unit at Moi Teaching and Referral Hospital.

2010
Mary Klotman, MD, is the first woman to become chair of the Department. She earned her undergraduate and medical degrees at Duke and completed her internal medicine residency and fellowship in Infectious Diseases, then spent 23 years at the NIH and Mount Sinai School of Medicine before returning to North Carolina.

HIGHLIGHTS: PARTNERSHIPS PAST, PRESENT AND IN DEVELOPMENT
“The Department of Medicine drives world-class clinical and academic research at Duke. What truly sets us apart as an institution is our passion for the three-part mission of academic medicine, our dedication to excellence and our focus on creating local—and global—partnerships. The word ‘collaborative’ doesn’t even begin to describe us.”

Mary E. Klotman, MD
Chair of Medicine
A PASSION FOR PARTNERSHIP

When the world woke last October to the news that Robert Lefkowitz, MD, would share the Nobel Prize in Chemistry 2012, the Duke University community rejoiced, and with pride. The honor marked the first Nobel for work by a Duke scientist and reflected 40 years of unrelenting basic science research—and mentorship—by Bob here in the Department of Medicine.

This Nobel Prize was one indication of the stellar work across the Department—in research, teaching and clinical care of patients. Indeed, the Department of Medicine drives world-class clinical and academic research at Duke and beyond. From G protein-coupled receptors to cancer care to kidney research to lung transplants to aging, our faculty are focused on new discoveries that will improve patient care.

And they don’t do it alone, sequestered away. They work together, across boundaries and outside of silos.

What truly sets Duke apart is our passion for the three-part mission of academic medicine, our dedication to excellence and our focus on creating partnerships—within Duke University Medical Center and around the world. The word collaborative doesn’t even begin to describe us.

This report captures some of these stories. Whether it’s cross-institutional, multi-disciplinary or team-focused, the narrative is the same: we’re bound by the same passion, so let’s build the strongest partnerships possible to move medicine ahead.

The Department’s 608 faculty are the driving force behind these partnerships. They are national leaders in their societies: Monica Kraft in the American Thoracic Society, Carl Berg in the United Network for Organ Sharing, Virginia Kraus in the Osteoarthritis Research Society International and Barbara Alexander in the Infectious Diseases Society of America.

They are principal investigators in national networks drawing on the expertise of Duke colleagues and resources: Bart Haynes in the Center for HIV/AIDS Vaccine Immunology and Immunogen Discovery and Vance Fowler in the Antibacterial Research Leadership Group.

They are leaders in campus institutes and centers facilitating team science: Tom Coffman in the Duke O’Brien Center for Kidney Research and Eric Peterson in the Duke Clinical Research Institute that grew from its roots in the Department and is today the largest academic clinical research organization.

They are the chiefs and clinical leads, training directors and teachers in our 13 divisions, waking every day dedicated to forging effective partnerships to advance our core missions.

Whether that results in a Nobel Prize, a new Duke institute, or an exploratory conversation, we celebrate their collaborations.

Mary E. Klotman, MD
Chair of Medicine
Duke nephrologist and associate professor of medicine Michelle Winn, MD, is a member of the Center for Human Genetics (CHG), which connects Medicine faculty with scientists and clinicians across the university to investigate inherited disorders and incorporate their genetic research findings into the diagnosis, treatment and prevention of disease.

Through her work at CHG, Winn has developed one of the world’s largest datasets for familial focal segmental glomerulosclerosis (FSGS), a form of kidney disease that is one of the more common causes of kidney failure requiring dialysis. It disproportionately affects minorities, and it can strike otherwise healthy individuals with devastating outcomes.

Winn, who has cataloged more than 200 families with FSGS, works with Duke geneticist David Goldstein, PhD, professor of molecular genetics and microbiology and director of the Center for Human Genome Variation, to use whole-exome sequencing on these families to better understand the genetic underpinnings of the disease.

“This collaboration has really increased the pace of finding genes associated with this disease,” Winn says.

It took her eight years using linkage analysis alone to find TRPC6, the first known ion channel mutation that causes FSGS.

“Working with David, who uses whole-exome sequencing in addition to linkage analysis, we think we’ve found two more genes associated with FSGS in the last year alone.”

Winn and Goldstein (pictured at left) also found the gene-encoding tenascin XB (TNXB), in which mutations cause vesicoureteral reflux, the most common congenital anomaly of the kidney and

**BIG SCIENCE, FAMILY AFFAIR**

**“THIS COLLABORATION HAS REALLY INCREASED THE PACE OF FINDING GENES ASSOCIATED WITH THIS DISEASE. WORKING WITH DAVID GOLDSTEIN, WHO USES WHOLE-EXOME SEQUENCING IN ADDITION TO LINKAGE ANALYSIS, WE THINK WE’VE FOUND TWO MORE GENES ASSOCIATED WITH FSGS IN THE LAST YEAR ALONE.”**

MICHELLE WINN, MD
Associate Professor of Medicine (Nephrology)
urinary tract and a major risk factor for pyelonephritic scarring and chronic kidney disease in children.

Winn and Goldstein were first able to work together when they received seed funding from the School of Medicine. Now their investigation is supported by an R01 award that Winn received last year from the National Institute of Diabetes and Digestive and Kidney Diseases to support further gene discovery in autosomal dominant FSGS.

“We’re hopeful that we’ll soon have a better understanding of the pathogenesis of FSGS,” she says. “It’s already been extraordinarily fulfilling to be able to tell the families what we’re learning about their disease using molecular genetics.”

Big science today requires collaborations, especially in genetics, Winn says, and Duke offers these opportunities. “Not many institutions have this breadth of institutional knowledge and resources. There’s always someone here who does what you’re looking for.”

When Winn wanted to test whether the genes she identified did cause FSGS, she found Nico Katsanis, PhD, professor of cell biology. Katsanis directs the Center for Human Disease Modeling in the Duke Institute for Genome Sciences and Policy (IGSP). Winn collaborates with him using cell biology approaches in her lab in conjunction with zebrafish models provided by his lab, to test for nephrotic syndrome, a surrogate for FSGS.

IGSP is a university-wide institute created in 2002 to facilitate interdisciplinary research exemplified by Winn, Goldstein and Katsanis. Fourteen faculty members in the Department of Medicine are also members or investigators in IGSP.

Gastroenterologist Andrew Muir, MD, associate professor of medicine, has also partnered with Goldstein. Their 2010 Nature paper showed that certain variants in the ITTA gene allow some patients with hepatitis C to avoid the hemolytic anemia that often accompanies treatment for the disease—a discovery that, like Winn’s work with FSGS, may help create more tailored and effective approaches for treating patients.

NATIONAL LEADERSHIP, LOCAL EXPERTISE

Vance Fowler, MD, MHS, professor of medicine in the Division of Infectious Diseases, said he first heard about the possibility of major NIH funding for an antibiotic resistance network about a year before the RFA was posted. That gave him time to consider how he’d respond.

When the time came, he was ready.

In 2013, the National Institute of Allergy and Infectious Diseases awarded a new six-year, $62-million federal grant to Fowler and co-PI Henry “Chip” Chambers, MD, professor of medicine at the University of California, San Francisco and chief of the Division of Infectious Diseases at San Francisco General Hospital.

Together, Fowler and Chambers have created the Duke-based national Antibacterial Research Leadership Group (ARLG) to identify, prioritize, execute and publish research in antibacterial resistance.

Chambers had flown to North Carolina several times during Fowler’s months-long process of writing his 550-page proposal. And equally as important as that long-distance collaboration was Fowler’s closer-to-home partnership with Daniel Benjamin, MD, PhD, MPH, professor of pediatrics at Duke and chair of the Pediatric Trials Network, housed at Duke Clinical Research Institute (DCRI).

“It’s a privilege to work on such a critically important national health issue with these resources; it is humbling,” says Fowler. “We just can’t have failure. We’ve got to win. This is just too important.”

MODELS OF SUCCESS

“You have to have the platform to conduct complex clinical trials over multiple countries and, perhaps more than any other institute in the country, the DCRI is poised to do that,” Fowler says. “The track record that DCRI brings to the table for NIH-funded networks is unprecedented.”

The DCRI is the largest academic research organization in the world, with more than 1,000 completed studies conducted by more than 5,000 investigators in 65 countries and enrollment totaling more than 1.2 million patients. The DCRI conducts clinical research across the spectrum, from phase 1 testing to midsize multicenter studies, global trials, and massive clinical registries and policy studies.

“The DCRI is a place where clinicians, statisticians and operational experts
design and conduct the very best clinical research,” says Eric Peterson, MD, MPH, professor of medicine in the Division of Cardiology and director of the DCRI. “We support high-quality clinical research that is both innovative and meaningful to our patients,” says Peterson. He is increasing the ways that the DCRI is accessible to the entire Department of Medicine and the broader Duke campus. Another model of success is the Center for HIV/AIDS Vaccine Immunology, led by Barton Haynes, MD, former chair of the Department of Medicine. He and his collaborators received one of the largest NIH grants ever to direct a consortium of universities and academic medical centers focused on solving the major problems in HIV vaccine development and design.

Oncologist Richard Riedel treats patients with soft-tissue and bone sarcomas. He’s also collaborating on improved palliative care for cancer patients.

“We are a mission-driven organization, supporting high-quality clinical research that is both practice-changing and meaningful to our patients.”

ERIC PETERSON, MD, MPH
Professor of Medicine (Cardiology) and Director of the Duke Clinical Research Institute
**Cancer Collaborations: Enhancing Discovery, Improving Care**

Gerard Blobe, MD, PhD, professor of medicine in the Division of Medical Oncology, knows how collaboration leads to opportunity.

“We have a rich resource in our fellow faculty, who are open and willing to collaborate, and that allows you to increase the scope of your science,” says Blobe.

He attends a weekly works-in-progress meeting of more than 50 labs involved in the Solid Tumor and Tumor Biology programs within the Duke Cancer Institute (DCI). Launched in 2010, DCI unites hundreds of cancer physicians, researchers, educators, and staff across the Duke medical center, medical school and health system.

When Hematology-Oncology fellow Brent Hanks, MD, PhD expressed interest in an “enhanced collaboration” to support his work in the science of immunotherapy and opportunities for translational medicine, Blobe connected him with surgeon H. Kim Lyerly, MD, and oncologist Michael Morse, MD, MHS. Together, they explored the TGF-beta signaling inhibitor in dendritic cells used for breast cancer immune therapies, then reached out to Douglas Tyler, MD, chief of surgical oncology and director of the DCI melanoma program, to test whether the effect of inhibiting TGF-beta signaling was applicable to another immune-regulated human cancer. Their results, suggesting a predictive immunotherapy biomarker, were published in the Journal of Clinical Investigation.

The internationally recognized Duke Adult Blood and Marrow Transplant Program, meanwhile, has performed more than 4,000 transplants since the program began in 1984 and it pioneered the use of cord blood cells for adults who don’t have a matched donor. Under the leadership of Nelson Chao, MD, MBA, chief of the Division of Hematological Malignancies and Cellular Therapy, Duke continues to expand the use of cord blood transplants and develop ways to reduce graft-versus-host disease in leukemia patients who receive partially matched bone marrow transplants.

Today, Duke is treating nearly 100 diseases with cellular therapy, and Chao is leading a first-in-the-country clinical trial of at-home stem cell transplants.

Duke clinicians are also advancing the care of women with breast cancer. In 2012, oncologists Kimberly Blackwell, MD, and Neil Spector, MD, the Sandra Coates Associate Professor of Medicine, started three specialized breast cancer clinics in the new seven-story Duke Cancer Center building: one for women younger than 45; one for women older than 70; and one for women with inflammatory breast cancer.

“We want to help women through their journey with breast cancer. Bringing patients with similar types of cancer together in one location increases our ability to attend to their unique needs,” says Blackwell, director of the Institute’s Breast Oncology Program.

In the inpatient solid tumor cancer wing of Duke University Hospital, oncologist Richard Riedel, MD, and palliative care expert Anthony Galanos, MD, are collaborating on a novel Onco-Palliative Care Unit that unites the two disciplines to provide cancer patients an extra layer of support. “A lot of our patients were coming in for symptom management, so this new model now provides palliative care input to patients on a daily basis,” says Riedel.

“This collaboration has turned out to be extraordinarily positive. The patients and families adore this model, and patient outcomes are improving,” adds Galanos, who was recently honored with the prestigious Cunniff-Dixon Physician Award for excellence in the practice of palliative medicine.

Based on that success, Arif Kamal, MD, started an outpatient clinic to integrate palliative care into oncology care plans. The majority of the clinic’s patients are in active chemotherapy. The complementary oncology and palliative care services are so seamlessly integrated, Kamal says, that patients often don’t realize they’re receiving separate services. “We’ve successfully moved palliative care upstream.”

**“We have a rich resource in our fellow faculty, who are open and willing to collaborate, and that allows you to increase the scope of your science.”**

**Gerard Blobe, MD, PhD**

Professor of Medicine (Medical Oncology)
1
NOBEL PRIZE AWARDED TO A FACULTY MEMBER: ROBERT LEFKOWITZ, MD
NOBEL PRIZE IN CHEMISTRY 2012

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CURRENT DEPARTMENT FACULTY MEMBERS ELECTED TO THE ASSOCIATION OF AMERICAN PHYSICIANS

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CURRENT DEPARTMENT FACULTY MEMBERS ELECTED TO THE AMERICAN SOCIETY FOR CLINICAL INVESTIGATION

MULTI-DISCIPLINARY

By fostering opportunities across our 13 divisions, we support physicians and investigators working together at the frontiers of medicine.
Throughout the last 20 years, Duke Medicine surgeons and pulmonologists have performed more than 1,200 lung transplants, making this one of the highest-volume programs in the country. At Duke, the wait-list time is only 12 days, compared to the nearly four-month national average, and the program offers transplants to older and more complex patients. With an 89% one-year survival rate—5% above the national average—the program has earned a reputation for quality care. Kathryn Flynn received a double lung transplant at Duke University Hospital 17 years ago, and today she works 45 hours a week as a nanny and serves on the board of the Lung Transplant Foundation. At the time of her transplant, she had provided tissue samples for a biobank that’s become a resource for faculty in the Division of Pulmonary, Allergy and Critical Care Medicine. In total, the Division has banked data and samples from more than 1,000 lung transplant patients.

“We now have a phenomenal opportunity to understand, across the whole genome, what genes regulate the development of chronic rejection,” says Scott Palmer, MD, MHS, associate professor of medicine and scientific director of the Duke Lung Transplant Program. For example, Palmer led a recent multicenter trial that showed that extending valganciclovir prophylaxis by an additional nine months significantly reduces post-transplant cytomegalovirus infection.

In addition to its lung program, Duke has transplant programs for heart, liver, small bowel, kidney and pancreas. Each reflects Duke’s commitment to excellent patient outcomes, and looks for ways to improve the science of transplantation. Carl Berg, MD, was recruited to Duke to be medical director of abdominal transplantation and to expand the liver transplant program. Berg serves as vice president of the United Network for Organ Sharing, and he brings a national perspective on organ allocation to Duke, where the collaborative environment has helped make the entire Duke transplant program successful, says Berg.

“At other institutions you don’t have hepatologists, nephrologists, surgeons, infectious diseases doctors, nurses and hospital leadership all in one location. It’s the ideal setup for multi-disciplinary care and leads to prompt problem solving and decision-making. It really sets Duke apart.”

Double-lung recipient Kathryn Flynn is one of more than 1,000 Duke lung transplant patients who have donated tissue samples to the Duke biobank.

“AT OTHER INSTITUTIONS YOU DON’T HAVE HEPATOLOGISTS, NEPHROLOGISTS, SURGEONS, INFECTIOUS DISEASES DOCTORS, NURSES AND HOSPITAL LEADERSHIP ALL IN ONE LOCATION. IT'S THE IDEAL SETUP FOR MULTI-DISCIPLINARY CARE AND LEADS TO PROMPT PROBLEM SOLVING AND DECISION-MAKING. IT REALLY SETS DUKE APART.”

CARL BERG, MD
Professor of Medicine (Gastroenterology)
“If you have kidney disease, your risk for cardiovascular disease increases greatly,” says Thomas Coffman, MD, professor of medicine and chief of the Division of Nephrology.

However, the reasons for this aren’t clear, and the increased incidence of cardiovascular disease in people with kidney disease is one of our most vexing problems, he says. Coffman and his colleagues in Nephrology, already known for excellence in kidney research, committed to establishing a collaboration that could decipher the mechanisms underlying the profound impact kidney disease imparts on cardiovascular morbidity and mortality. The nephrologists connected with colleagues in the Division of Cardiology, the Duke Translational Medicine Institute and the Duke Clinical Research Institute, among others.

This collaboration across the department and campus made Duke competitive for a P30 grant from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and, last year, Coffman was awarded a five-year, $5.8-million grant as part of the NIDDK’s George M. O’Brien Kidney Research Core Centers program. Coffman’s group was one of only six nationally to receive funding through this program, which will bring even more state-of-the-art technologies and resources to Duke for the study of kidney disease.

“Duke’s strong research base and history of collaborative investigation, along with our compelling scientific plan, reflected the priorities of the NIH,” says Coffman. “And our history of multidisciplinary work showed how our whole could be greater than the sum of our parts.”

One of Coffman’s collaborators in the Duke O’Brien Center for Kidney Research is Howard Rockman, MD, professor of medicine in the Division of Cardiology. He studies the molecular mechanisms of hypertrophy and heart failure and was elected editor-in-chief of the prestigious Journal of Clinical Investigation in 2011. The editorial board sits at Duke, with weekly meetings of colleagues from the School of Medicine, peers at nearby University of North Carolina at Chapel Hill and faculty at Duke-NUS Graduate Medical School Singapore.

In addition to leading the Duke O’Brien Center, Coffman directs the Cardiovascular Research Center (CVRC), another new initiative at Duke and Duke-NUS, spanning six academic departments and created to promote the exploration of the molecular pathogenesis of cardiovascular disease.

“DUKE’S STRONG HISTORY OF COLLABORATIVE INVESTIGATION SHOWS HOW OUR WHOLE COULD BE GREATER THAN THE SUM OF OUR PARTS.”

THOMAS COFFMAN, MD
Professor of Medicine and Chief of the Division of Nephrology
What makes one person more likely than another to get an infectious disease is the question Dennis Ko, MD, PhD, is working to answer in his new role at Duke. He studies the genetic basis for differences in susceptibility to infection and inflammatory disorders.

Ko is one of several new faculty members in the Department hired through the School of Medicine Partnership Hires Recruiting Initiative, a program developed by Dean Nancy Andrews, MD, PhD, to encourage strategic interdisciplinary recruitment of the highest-caliber faculty members. Ko is an assistant professor with appointments in the Division of Infectious Diseases, the Duke Center for Human Genome Variation and the Department of Molecular Genetics and Microbiology.

This type of partnership affords faculty unique opportunities to advance medical research by forming partnerships with investigators across fields.

“So far, the Department of Medicine has jointly created four exciting partnership hires with our colleagues to find the best talent,” says Mary Klotman, MD, chair of the Department. “This initiative is providing the Department with faculty who have diverse backgrounds and skill sets, and it presents promising opportunities for our faculty to collaborate on large multi-investigator projects.”

Using high-throughput human in-vitro susceptibility testing, Ko takes cell lines from hundreds of different people and infects them with the same strain of bacteria at exactly the same amounts and then identifies variations in cellular response. He has worked with a researcher in Vietnam who collected DNA samples from patients with Salmonella typhi infection, and he’s partnered with Duke colleagues to test more than 15 other pathogens.

The Partnership Hires Recruiting Initiative has brought other exciting faculty to the Department.

Matthew Hirschey, PhD, has appointments in the Department as an assistant professor in the Division of Endocrinology, Metabolism and Nutrition, the Department of Pharmacology and Cancer Biology and the Sarah W. Stedman Nutrition & Metabolism Center. The primary focus of his work is to identify the physiological importance of the SIRT3 protein, in vivo, and to explain the complex regulatory role of acetylation in the mitochondria.

John Rawls, PhD, bridges the Division of Gastroenterology, the Duke Institute for Genome Sciences and Policy and the Department of Molecular Genetics and Microbiology. Rawls’ research focuses on the intestinal microbiome, digestive physiology, adipose tissue physiology and zebrafish as model organisms.

Lawrence David, PhD, spans the Division of Infectious Diseases, the Duke Institute for Genome Variation and the Department of Molecular Genetics and Microbiology. He has a background in computational biology and microbial genomics and studies the bacterial communities that live in and on the human body.

By jointly recruiting individuals, Duke confirms that its departments and institutes work most effectively together to illustrate its cross-disciplinary and collaborative environment, with easy linkages between the clinical and basic sciences, says Joseph Heitman, MD, PhD, chair of the Department of Molecular Genetics and Microbiology and professor of medicine in the Division of Infectious Diseases.

“This approach ensures that we bring on individuals who are committed to building programs broader than merely their own lab and also ensures that they have a series of contacts and colleagues who they can call from day one on campus, rather than having to wait for years for these opportunities to present themselves.”
Cardiologist Svati Shah and Christopher Newgard, director of the Sarah W. Stedman Nutrition and Metabolism Center and the new Duke Institute of Molecular Physiology, discuss work that is beginning to paint clear profiles of certain high-risk metabolic biomarkers for both heart disease and diabetes.

“The Stedman Lab can tell you what’s in your blood, and exactly how much of it there is— they helped us validate a specific metabolite cluster that was elevated among patients who had heart events.”

Svati Shah, MD, MHS
Associate Professor of Medicine (Cardiology)
By facilitating team science and career mentoring, we promote the idea that together we propel medical knowledge further. Examples from across the Department of Medicine.

**CARDIOLOGY**

**DIVISION CHIEF**
Christopher O’Connor, MD*

**CLINICAL CHIEF**
Joseph Rogers, MD

**FACULTY MEMBERS**
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Each year, Cardiology faculty members publish more than 500 papers in peer-reviewed journals, with close to 20% in high-impact publications. Recently, O’Connor and colleagues, along with collaborators in Hematology, Psychiatry and Behavioral Sciences, the Center for Aging, the Duke Clinical Research Institute and the Duke Heart-Mind Center, published an article in JAMA discussing results from the REMIT study that assesses the impact of the drug escitalopram on stress-related myocardial ischemia. The results further the understanding that modifying central and peripheral serotonergic function could improve CHD symptoms and may have implications for understanding the pathways by which negative emotions affect cardiovascular prognosis. The Duke Heart-Mind Center is one of the country’s first dedicated program for studying the link between emotional and cardiovascular health. Another sign of excellence in the Division: Duke is home to editors of The Journal of Clinical Investigation, the American Heart Journal and the Journal of the American College of Cardiology: Heart Failure.

*Dr. O’Connor also serves as chief of the Division of Clinical Pharmacology, with seven faculty members.

cardiology.medicine.duke.edu

**ENDOCRINOLOGY, METABOLISM AND NUTRITION**

**DIVISION CHIEF**
Mark N. Feinglos, MD

**CLINICAL CHIEF**
Jennifer Perkins, MD

**FACULTY MEMBERS**
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Eight faculty of the Division of Endocrinology, Metabolism and Nutrition are members of the interdisciplinary Sarah W. Stedman Nutrition and Metabolism Center. Members Larry Gene Moss and Jennifer Moss run a lab that concentrates on the physiology, cell and molecular biology of pancreatic islets to discover cures and treatments for diabetes and obesity. They are working with Hans Hohmeier and Christopher Newgard in the Stedman Center and the Genomics Institute of the Novartis Research Foundation to identify drugs that may reproduce the effects of a transcription factor to induce growth of insulin-producing beta cells. They are also working with Jennifer West of Duke Biomedical Engineering to develop a vascularized human islet hydrogel. Division Chief Mark Feinglos collaborated with a team of Duke biomedical engineers to develop a fusion protein sensitive to body heat, and Bryan Batch participates with Vice Chancellor for Clinical Research Robert Califf on a CMS Health Care Innovations award to reduce Type 2 diabetes in four Southeastern counties.

diabetes.medicine.duke.edu
Gastroenterology faculty members Manal Abdelmalek, Cindy Moylan, Hans Tillmann and Anna Mae Diehl, together with colleagues in the Center for Human Genetics, the Duke Institute for Genome Sciences and Policy, the Department of Pathology and the Department of Surgery’s bariatric surgery program, have identified a relatively small group of genes with expression patterns that reliably correlate with the severity of non-alcoholic fatty liver disease (NAFLD). This discovery suggests novel targets for the development of biomarkers, as well as new treatments for patients with severe NAFLD. Another collaboration, with GI hepatology, bariatric and transplant surgery and radiology, is pursuing a protocol to evaluate obese patients’ levels of portal hypertension and then help them lose weight via bariatric surgery. Rodger Liddle recently served as president of the American Pancreatic Association, and Division Chief Diehl was honored by the AASLD for sustained scientific contributions to the field of liver disease and the scientific foundations of hepatology.
gastroenterology.medicine.duke.edu

Division of General Internal Medicine faculty members are leaders in disease prevention, health promotion, medical care, and medical education, and they provide care throughout Duke Medicine. Gene Oddone leads the Center for Health Services Research in Primary Care at the Durham VA Medical Center and received $10 million for a Center of Innovation and for Collaborative Research to Enhance and Advance Transformation and Excellence. James Tulsky leads an expanding Palliative Medicine Department at Duke Hospital and received the 2013 George L. Engel Award for advancing communication in healthcare. Karen Steinhauer received a national grant to study spiritual care. Several faculty members received NIH awards, and others won numerous teaching awards and developed novel medical education programs. David Edelman leads Duke’s Clinical and Translational Science Award T32 training program. David Simel edited JAMA’s Rational Clinical Examination Series. Faculty studied and published prominent papers on national health initiatives, including breast cancer screening guidelines and the patient-centered medical home.
generalmedicine.medicine.duke.edu

The Geriatrics Division has a long history of successful development and implementation of novel approaches to the care of frail elders, including one of the first outpatient assessment programs in the nation, the Geriatric Evaluation and Treatment Clinic. More recently, the Division has begun to apply this experience to the care of older adults undergoing surgery through the Peri-operative Optimization of Senior Health (POSH) program, which aims to optimize care and improve outcomes for high-risk older adults who undergo elective surgery at Duke. Through POSH, Duke physicians, nurses and social workers from Geriatrics, Anesthesiology and Surgery co-manage patients in the weeks leading up to surgery and throughout the hospitalization period. Former Medicine chair Harvey Jay Cohen and other Geriatrics faculty also lead the Duke Center for the Study of Aging and Human Development, an all-university program with strong connections to multiple Duke entities, the Durham VA Medical Center and the Hartford Center of Excellence.
geriatrics.medicine.duke.edu

A recent merger of the Hematologic Malignancies Program (formerly a section of Medical Oncology) and the Division of Cellular Therapy, the Division is an enriched partnership between two complementary groups who see hundreds of patients annually with various types of leukemias, lymphomas, myelomas, myelodysplastic disorders, autoimmune and myelodysplastic disorders, aplastic anemia and other less common malignancies of the blood system. Duke has earned global recognition for leadership in bone marrow and stem cell transplantation and application of these techniques in the treatment of pediatric and adult cancers (see page 10). Division Chief Nelson Chao is PI for the Radiation Countermeasures Center of Research Excellence, a collaboration with Mark Dewhirst, professor of radiation oncology, and others at the University of North Carolina at Chapel Hill, Wake Forest University and University of Arkansas for Medical Sciences. They research new medical countermeasures against radiological and nuclear exposures due to terrorist attacks.
cellulartherapy.medicine.duke.edu
Thomas Ortel, MD, PhD, new chief of the Division, is leading a project under a U54 grant from the National Heart, Lung and Blood Institute, given to Bruce Sullenger, PhD, of the Department of Surgery and Richard Becker (now at the University of Cincinnati) to study thrombosis and hemostasis employing an oligonucleotide-based platform. The group also received the Administrative Coordinating Center grant for the overall U54 program. Its work has lead to a multi-investigator initiative focused on polymers, cell-free DNA and novel delivery systems. Recently, faculty member J. Brice Weinberg, staff physician in hematology-oncology at the Durham VA Medical Center, was awarded the prestigious William S. Middleton Award for outstanding achievement in biomedical or behavioral research by the U.S. Department of Veterans Affairs.

hematology.medicine.duke.edu

Vance Fowler is leading the new national Antibiotic Resistance Leadership Group (see page 7). Daniel Sexton is director of the Duke Infection Control Outreach Network (DICON) that connects 43 community hospitals in five states. He is also PI of the Duke University-UNC Prevention Epicenter, funded through a $10-million grant from the Centers for Disease Control and Prevention. This is a collaborative, multi-hospital study investigating the effectiveness of standard chemical cleaning strategies compared to new ultraviolet light techniques for sterilizing hospital rooms and reducing the spread of health care-associated infections. Division faculty also participated in the Symposium on Insights and Solutions for Emerging Infectious Diseases, a joint meeting of physicians and scientists from Duke, Duke-NUS Graduate Medical School Singapore, UNC-CH, UCLA and the Karolinska Institute in Stockholm meant to foster collaboration and inspire faster development of diagnostic tests, therapies and vaccines.

infectionsdiseases.medicine.duke.edu

The faculty in the Division of Medical Genetics work with researchers in a wide variety of disciplines, including Ronald Goldberg, chief of Neonatology, and Nico Katsanis, director of the Center for Human Disease Modeling; they collaborate in the Duke Task Force for Neonatal Genomics. Division Chief Elizabeth Hauser is working with cardiologist William Kraus and the Environmental Protection Agency to identify genetic susceptibility for increased risk of cardiovascular disease due to air pollution. Cardiologist SvatI Shah developed a comprehensive cardiovascular genetics clinic and collaborates with Susan Gurley in Nephrology and Chris Newgard in Metabolomics work with Kraus, Hauser and Shah to identify the genetic architecture of the disease using Duke’s unique CATHGEN biorepository and database for investigating relationships between genes, cardiovascular disease and outcomes.

medicalgenetics.medicine.duke.edu

James Abbruzzese of the M.D. Anderson Cancer Center became division chief in November 2013. The Division of Medical Oncology and its faculty are key partners in the Duke Cancer Institute. Amy Abernethy directs the Duke Cancer Care Research Program and leads the new Center for Learning Health Care in the Duke Clinical Research Institute, developing and testing learning care delivery systems and evidence-based, patient-centered care. Victoria Seewaldt, director of the Breast Cancer Prevention Program at the Women’s Wellness Clinic, joined with colleagues at Duke and Tufts University to win a competitive NCI/NI Provocative Question R01 to investigate the role of MCP-1 signaling in promoting triple-negative breast cancer in obese women. Gerard Blobe and his lab worked with physicist Richard Superfine, at UNC-CH and Andrew Berchuck of Duke’s OB/GYN department to demonstrate that altering cell stiffness predictably alters cell invasiveness. Sandeep Dave, director of the Molecular Genetics and Genomics Program, collaborates with allergist Patricia Lugar to study the genetic link between immune deficiency and lymphomas.

medicaloncology.medicine.duke.edu
### Nephrology

**Division Chief**
Thomas Coffman, MD

**Clinical Chief**
Stephen Smith, MD, MHS

**Faculty Members**
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Nephrology Division Chief Thomas Coffman was awarded a five-year, $5.8-million grant as part of the NIDDK’s George M. O’Brien Kidney Research Core Centers program, which provides state-of-the-art technology and resources to study kidney disease (see page 17). Susan Gurley, who studies mouse models of hypertension and diabetic nephropathy, is collaborating with Duke Institute for Brain Sciences investigator Rima Kaddurah-Daouk, a pioneer in the field of metabolomics, to develop new models for understanding the pharmaco-metabolomics of hypertension. Steven Crowley is working with David Virshup and Babita Madan at Duke-NUS to determine the critical cell lineages responsible for the PORCN gene and resulting Wnt-mediated kidney fibrosis, which will guide development of a new generation of targeted inhibitors of fibrosis. Matthew Sparks, who as a fellow collaborated with colleagues across the country on the online Renal Fellow Network, is now on faculty and has received a Career Development Award from the VA to fund studies into the role of kidney vasculature in hypertension.

*nephrology.medicine.duke.edu*

### Pulmonary, Allergy and Critical Care Medicine

**Division Chief**
Monica Kraft, MD

**Clinical Chief**
Joseph Govert, MD

**Faculty Members**
58

Ongoing collaborative efforts in the Division of Pulmonary, Allergy and Critical Care Medicine are focused on fibrosis, lung progenitor cells and acute lung injury. Division faculty are working with the Department of Cell Biology, and are expanding pulmonary research in the Duke Clinical Research Institute. This recently resulted in a Journal of Clinical Investigation research article discussing Type 2 alveolar cells as stem cells in adult lungs. Division Chief Monica Kraft collaborates with Joseph Heitman, chair of the Department of Molecular Genetics and Microbiology, Charlie Saunders from Proctor and Gamble and Annika Scheynius from the Karolinska Institute in studies of asthma, seeking links to Malassezia sympodialis, the major species associated with the risk of eczema. Previously, the U.S. Health Resources and Service Administration recognized Duke for having the highest national lung transplant rate and zero wait-list deaths—and designated Duke as the nation’s only Silver Level lung transplant center.

*pulmonary.medicine.duke.edu*

### Rheumatology and Immunology

**Division Chief**
William St. Clair, MD

**Clinical Chief**
Megan E.B. Clowse, MD, MPH

**Faculty Members**
14

The Division of Rheumatology and Immunology is the home of an Autoimmunity Center of Excellence (ACE), one of only nine sites in a national network of biomedical research centers sponsored by the National Institutes of Health to foster collaborations between basic and clinical scientists and facilitate clinical trials of innovative therapies. Faculty members collaborate with researchers from a variety of disciplines and specialties to discover and test new treatments for autoimmune diseases, including rheumatoid arthritis, systemic lupus erythematosus, primary Sjögren’s syndrome and autoimmune blistering diseases. These clinical studies are heavily enriched by state-of-the-art laboratory investigations that aim to illuminate the mechanisms of treatment response and the pathophysiology of disease. David Pisetsky and Michael Hershfield were recently designated Masters of the American College of Rheumatology, which recognized the two for their career achievements and leading education and research roles in the Division.

*rheumatology.medicine.duke.edu*
NEW MODELS IN MEDICAL EDUCATION

The Department of Medicine continues to pioneer evidence-based medicine training. With 155 internal medicine resident trainees, and 163 fellows on 13 training grants across 12 programs, competitive training opportunities span the Department, School of Medicine and beyond.

Exciting new efforts and a longstanding commitment to global health are presenting opportunities to improve the quality of care and develop new medical education models.

QUALITY IMPROVEMENT IN RESIDENT EDUCATION

In 2012, the Durham VA Medical Center appointed its first chief resident in quality improvement and patient safety, one in a network of some 32 VA chief residents across the country focusing on quality and safety. Duke University followed suit and appointed a Duke Quality Scholar. Both positions are championing a number of resident-initiated safety and quality-improvement efforts at the hospitals.

“When our residents identify problems that they think can be solved, they understand that they have a place to go to discuss and work on them,” said David Simel, MD, vice chair of Veterans Affairs in the Department of Medicine.

This focus on quality improvement and patient safety is part of a larger effort by the Department to provide high-value care, a patient-centered approach that results in improved outcomes and cost savings.

Meanwhile, Aimee Zaas, MD, MHS, director of the Internal Medicine Residency Program, and Amy Abernethy, MD, director of the Center for Learning Health Care, are creating a new Comprehensive 21st Century Care Curriculum for graduate medical education trainees that will provide a framework for the delivery of high-value, cost-conscious care and a learning health system for Duke residents.

PROGRAM LEADERSHIP

DIRECTOR, INTERNAL MEDICINE RESIDENCY PROGRAM
Aimee Zaas, MD, MHS

LEARN MORE
residency.medicine.duke.edu

ASSOCIATE PROGRAM DIRECTORS
Murat Arcasoy, MD
Jonathan Bae, MD
David Butterly, MD
Alex Cho, MD, MBA
Charles William Hargett, MD

GLOBAL HEALTH RESIDENCY

As a young doctor in the mid-1980s, Ralph Corey, MD, spent four months in a mission hospital in Bomet, Kenya. He worked in the women’s ward, caring for dozens of patients and making do with 14 cots on a mud floor. “I grew up in that place,” he says. “I was very involved with my patients, and I loved it.”

The experience left such a profound impression on Corey that, when he returned to the United States, he immediately began to develop a program that would allow medical residents to work abroad. Duke has since sent more than 350 residents to Brazil, China, Pakistan, Thailand, Kenya, Tanzania and Australia.

Corey, vice chair for education and global health in the Department of Medicine, directs the Hubert-Yeargan Center for Global Health in the Duke Global Health Institute. The Center aims to train globally educated, socially responsible physicians who are dedicated to improving the health of disadvantaged populations. It sponsors two- to three-month clinical rotations for internal medicine residents who are interested in conducting research and providing clinical care to patients abroad, as well as an extended 10- to 12-month global health residency. In addition, residents may participate in the 18-month Global Health Pathway, split between nine months studying for a masters degree in global health and nine months participating in clinical care and research in the developing world.

The Center also supports basic and clinical research programs designed to help minimize the burden of global diseases such as HIV/AIDS, malaria and tuberculosis.

“Global health requires a multidisciplinary approach. We have interactions on a daily basis with faculty members not only from the School of Medicine but from social sciences, political sciences, epidemiology and economics, and that is really a strong part of the program,” says John Stanifer, MD, an internal medicine and global health resident interested in the epidemiology of chronic kidney disease in the Kilimanjaro region of Tanzania. Stanifer is planning to become a nephrology fellow and implement a prevention strategy across a much broader region.
Duke University is home to approximately 13,000 undergraduate and graduate students and a world-class faculty helping to expand the frontiers of knowledge. The university has a strong commitment to applying knowledge in service to society, near its North Carolina campus and around the world.

Duke Medicine, which includes the Duke University Health System, the Duke University School of Medicine and the Duke University School of Nursing, combines research, clinical care and education at many different sites throughout the region and beyond.

Durham is at the apex of North Carolina’s famed Research Triangle, an area formed by Duke University, North Carolina State University in Raleigh (20 miles from Duke) and the University of North Carolina at Chapel Hill (11 miles from Duke). Durham is also close to the coast and the mountains.

Durham is commonly recognized for its availability of jobs, relatively low cost of living, affordable housing, safe streets, mild climate, culture and recreation. In 2012, Durham was designated “smartest city” and “foodiest town.”