

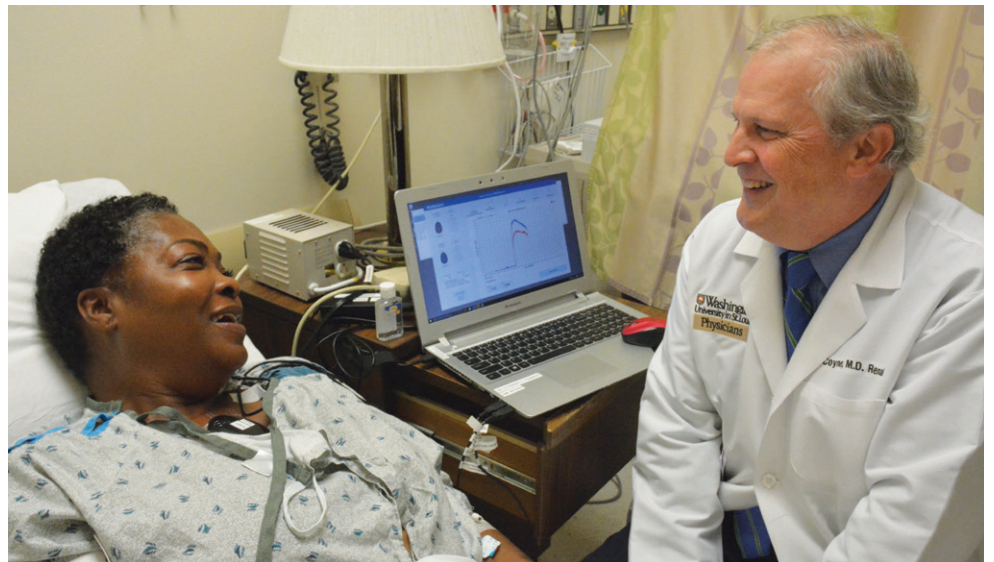
# NEPHROLOGY UPDATE

## Potential New Vital Sign: Investigational GFR Study Under Way At Washington University

**R**enal specialists in the Division of Nephrology at Washington University School of Medicine are the first to test a new investigational fluorescent tracer agent in combination with an optical renal function monitor to more accurately measure glomerular filtration rates (GFR) in patients with chronic kidney disease (CKD). Early results from the first handful of patients indicate that the agent, called MB-102, could be very promising in monitoring CKD patients and those at risk for acute kidney injury, although researchers stress more and larger clinical studies are needed.

“We began studying this in a Phase I study in July and have evaluated it in about 20 patients to date with promising results,” says Daniel Coyne, MD. “We are comparing its effectiveness to measure GFR against Iohexal, one of two common drugs used to track GFR.”

Renal function is typically clinically measured with a serum creatinine test to determine how well the kidneys are filtering waste products. That glomerular filtration rate however, is a rough estimate. “We can use serum creatinine and other patient characteristics such as age, gender and race to estimate GFR, but, for example, if we think the eGFR is 45 ml/min, it could be as low as <30 ml/min or as high as 60 ml/min,” says Coyne. “A patient that is found through a serum creatinine test to be in



Daniel Coyne, MD, checks in on Kittie Murray, a nephrology patient participating in the GFR monitoring study.

stage 3 chronic kidney disease may not actually be at that stage or be significantly worse because of that variance.”

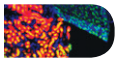
Optical renal function monitors and tracer agents have been used to measure GFR in basic research studies with success, but this is the first time a fluorescent GFR tracer agent has been developed for human clinical trials. Researchers place the optical monitor directly on the skin and then give an IV with MB-102 to the patient. “The monitor excites the fluorescent agent with a blue light and detects the amount of green light coming back, which is consistent with the concentration of the agent as it moves through the body and is eliminated by the kidneys,” Coyne explains. “We monitor GFR by measuring the fluorescent of the agent through the skin instead of measuring agent concentration by taking multiple blood samples over the course of several hours.”

The purpose of this initial study is to determine the accuracy and range of GFR measurement, especially at the low end.

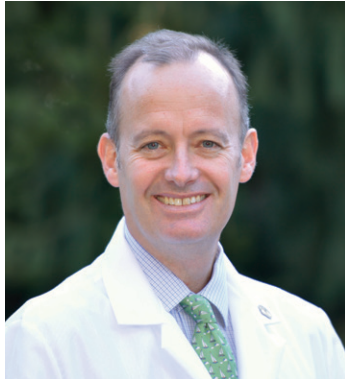
At this point, GFR is measured in patients with normal kidney function through Stage 4 CKD. Benjamin Humphreys, MD, Chief of the Division of Nephrology, is among multiple researchers who have been using transdermal GFR in pre-clinical research, with accurate results. “In patients, this noninvasive way to measure instantaneous GFR could dramatically improve our ability to diagnose kidney disease and injury earlier, especially in the ICU,” he says.

MediBeacon, Inc., the developer of MB-102, says more than 45 peer-reviewed articles have demonstrated the efficacy and effectiveness of a similar dye and technology in pre-clinical studies. Richard Dorshow, PhD, Chief Scientific Officer and co-founder of MediBeacon, led the development of MB-102 and oversees the clinical trial. MediBeacon CEO and co-founder Steve Hanley says, “With transdermal GFR using MB-102, we think we’ve developed a new vital sign.”

Further studies get under way at Washington University and other sites next year.



# Message from the Chief



There has been a sense of excitement this fall in the division as we have welcomed new fellows and several new faculty members. New faculty members include Monica Chang-Panesso, MD, Yong-Feng Gong, PhD, Andreas Herrlich, MD, PhD, Anuja Java, MD, Patricia Kao, MD and Hani Suleiman, MD. We have also hired a new inpatient nurse practitioner, Dennis Littleton, ANP, who will help care for hospitalized ESRD patients and in so doing unload the fellows.

The division has been active in educational outreach and community building among friends and alumni. Tim Yau, MD has created the Washington University in St. Louis Nephrology Web Series – a video teaching series on YouTube that covers an array of nephrology topics. This has been quite popular, with over 10,000 views and 400 subscribers from all around the world. Our third Paul Mennes Memorial City-Wide Renal Rounds was another big success last month, with a stimulating talk and discussion with Richard Glassock, MD. We also have a new facebook page (@WUSTL-Nephrology) and a Twitter feed (#WUNephrology) and we encourage you to follow both and stay in touch with the division.

On the clinical front, we are building a new dialysis unit in North County to better serve our numerous patients that live there. Our transplant group is going strong and on pace to perform more than 250 transplants this year. Over the summer, Director of

Transplant Nephrology, Dr. Daniel Brennan, was honored with the Lifetime Achievement Award from the American Society of Transplantation. Finally, we are proud that the hard work that our faculty, fellows and staff do was recognized in the *US News & World Report* Best Hospital List, where we moved up three spots to rank #8 in the country, the highest ranking division in the School of Medicine.



We hope to see many of you at our annual American Society of Nephrology Alumni and Friends Reception in Chicago. This will be held in the Crystal Room at the Palmer House Hilton, Friday November 18, 6:45 – 9pm. All are invited!

*Ben*

Benjamin D. Humphreys, MD, PhD,  
Associate Professor and Chief,  
Division of Nephrology,  
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## Thank you to the following donors

The following individuals have made donations in the past six months to the Division of Nephrology. Your support helps us to advance the field of nephrology by enhancing our fellowship training programs and supporting distinguished lectureships and other activities. Thank you for your support!

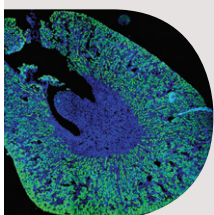
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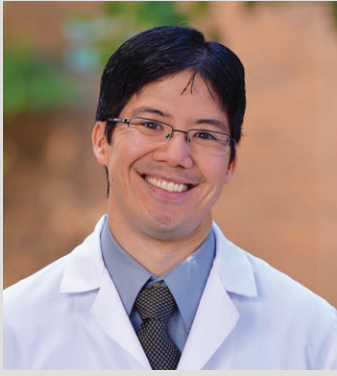
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You may also contact Helen Liu directly at 314-935-9715 or by email at [helen.liu@wustl.edu](mailto:helen.liu@wustl.edu) if you would like to consider supporting the Division of Nephrology through appreciated stocks, deferred giving, beneficiary plans or other assets.



# Fellowship Notes



**By Steven Cheng, MD, Director, Nephrology Fellowship Program**

We are excited this year to debut a new fellowship training program video that serves as a visual recruitment tool for our program here at Washington University School of Medicine.

This video really encompasses what makes our program unique — the depth and breadth of the training pathways available — and showcases some of the committed fellows already in our program. Whether a fellow desires a career in general nephrology or is interested in pursuing focused careers in clinical or basic research, interventional nephrology, home dialysis or transplant, we have the faculty and comprehensive clinical and research opportunities to allow for one-on-one mentoring.

What I really think this video shows is the passion

behind our program and I hope it fosters fond memories of the time when you trained here. Our newest fellows are already jumping into the program. Before 8 a.m. each day, fellows have begun to outline care plans and schedule the day's dialysis and CRRT treatments with Faye and Roberta, our two stalwart unit secretaries who have organized the flow of traffic through the unit for well over a decade. Rounds are often full of new discoveries, pearls of wisdom, and clinical breadcrumbs that lead to diagnostic revelation. Throughout their training, there is a palpable sense of collegiality

and cooperation among faculty, fellows and staff — a tradition that dates back well beyond the 10 years I have already spent here. That spirit of togetherness is a definite asset to our program which I, as program director, am most proud.

Take a look at our promotional video when you get the chance and even email us back with some of your foundational moments that you experienced in our program.

As Andy Worhol said, some of us now have our “15 minutes of fame” as video stars!

The video can be found online at <https://renal.wustl.edu>.

## Welcome New Fellows

Welcome to our first-year fellows!

**Dr. Deepa Amberker** went to medical school in Indiana, completing her residency at Abington Memorial Hospital in PA.

**Dr. Owais Bhatti** went to medical school in Pakistan, completing his residency at University of Oklahoma Health Sciences Center.

**Dr. Sreelatha Katari** completed medical school in India, completing her

residency at Abington Memorial Hospital in PA.

**Dr. Pooja Koolwal** went to medical school in Houston, TX, completing her residency here at Washington University.

**Dr. Gerry Macutay** went to medical school in the

Philippines, completing his residency at Case Western Reserve University in OH.

And welcome back to our returning fellows:

**Nurelign Abebe, MD;**  
**Fahad Edrees, MBBS;**  
**Karthikeyan Venkatachalam,**

**MBBS; Usman Younus, MBBS and Yifei Zhang, MD.**

**Dr. Reem Daloul and Dr. Sagar Gupta** also return as transplant fellows.



Left to right, back row: Fahad Edrees, MBBS; Usman Younus, MBBS; Yifei Frank Zhang MD; and Owais Bhatti, MD.

Left to right, front row: Sagar Gupta, MD; Karthikeyan Venkatachalam, MBBS; Pooja Koolwal, MD; Reem Daloul, MD; Deepa Amberker, MD; Sreelatha Katari, MD; and Gerry Macutay, MD.

# Alumni Connections

## Mabel Purkerson, MD

Renal Fellow, 1963-65

Renal Faculty, 1965-1998

She may, at times, still exhibit a genteel southern accent from her early years in South Carolina, but for more than 50 years, Mabel Purkerson, MD, has been a formidable force in renal research, clinical care and leadership at Washington University School of Medicine.

Purkerson was among the group of physicians involved in the first peritoneal



Mabel Purkerson, MD

dialysis case at St. Louis Children's Hospital in the early 1960s. "I remember mixing the dialysis solutions myself and then we would titrate it according to need," she

says. "It was an amazing time to be in this relatively new field of nephrology and do such groundbreaking work."

Although she came to St. Louis to complete a residency and fellowship in pediatrics, she was drawn to study renal disease after meeting giants in the field. Neal Bricker, MD, the first head of the Division of Nephrology, led the first hemodialysis procedure performed at Barnes Hospital, assisted by surgeon Harvey Bernard, MD. The dialysis apparatus consisted of an old washing machine with an agitator for stirring the dialysis fluid and the cellulose coil was wound by hand. "Before that time, if a person was diagnosed with chronic nephritis and renal failure, you knew the outcome was death," Purkerson says. "There was no dialysis, no transplantation and people didn't use many steroids then."

She approached Dr. Bricker, who already had a vibrant research lab focused on understanding the pathophysiology of the kidney and the mechanisms involved in renal failure. She joined the team as its first female researcher (and the Division's first female instructor) and, along with colleagues Saulo Klahr, MD and Eduardo Slatopolsky, MD, was instrumental in research focused on the causes and triggers of kidney function decline. The team's collective work, which started with Bricker's Intact Nephron Hypothesis, and the work of others to follow, formed the basis of what became the longest continuously funded NIH renal research project (Program Project Grant). Purkerson went on to research renal obstruction, the role of PTH in acute renal failure, the impact of diet on renal disease and the role of antithrombotic agents in treating glomerulonephritis.

She rose to become the first female full professor in the Department of Medicine and the first woman to serve on the dean's staff. In 1983, after witnessing the need for mentoring opportunities for a growing number of female nephrologists, Purkerson co-founded Women in Nephrology. "You know, it was hard back then being a woman," she notes. "Although there was a collegial atmosphere here at the medical center, female nephrologists were invisible people on the national stage." More than 100 women attended the first meeting held one evening during the annual ASN meeting in Washington, DC.

Today, although she is technically "retired" as professor emeritus since 1998, Purkerson's life is far from sedentary and never far from the medical center.

"Well, I'm headed to Burma again next year," she says matter-of-factly. "I love



Mabel Purkerson, MD, in Kayah State, Myanmar in March 2015.

to explore cultures and traditions around the world, especially in undeveloped or developing countries."

That passion has taken her to all seven continents, including Antarctica — twice. Simultaneously, she has been busy compiling information and anecdotes for a book focused on the history of the School of Medicine, much like she did for a commemorative book celebrating the centennial of the Department of Medicine. She says with a laugh, "Researching these has been like trying to capture a rolling stone."

"I was in the renal division at the best possible time and witnessed changes that were absolutely amazing, simply spectacular," she adds. "It's been a fascinating career. I would have to say that, with all that I've been able to do, mine's been a champagne life."

# Program Spotlight

## Comprehensive Critical Care Nephrology Program

At Barnes-Jewish Hospital, renal specialists in the Division of Nephrology oversee one of the most comprehensive and busiest critical care nephrology programs in the Midwest. One of the important roles of critical care nephrology is to provide care for patients in the intensive care unit (ICU) that require renal replacement therapy after they develop acute kidney injury (AKI) in the setting of major surgery or other critical illness.

“These patients can develop multifactorial acute kidney injury (AKI) as a result of hypotension, sepsis, medication complications or other factors,” says Anitha Vijayan, MD, Medical Director of Acute Dialysis Services. “About 20 percent of ICU patients can develop AKI as a result of their medical condition. While less than half require renal replacement therapy (RRT), those patients that do have a very high mortality and need extremely close monitoring.”

Barnes-Jewish Hospital is a tertiary care medical center with approximately 140 ICU beds. Its Acute Dialysis Services, which are overseen by WU nephrologists, offer various modalities of RRT in the ICU, including continuous renal replacement therapy (CRRT), intermittent hemodialysis (IHD), prolonged

intermittent renal replacement therapy (PIRRT) and peritoneal dialysis (PD). “We handle over 1,200 RRTs per month,” says Vijayan. “It’s unusual to have more than one or two different RRT modalities at other centers, but we find that multiple options are better for patient comfort and mobility as they transition from the ICU to a step-down floor.”

Earlier this year, Vijayan and her colleagues Fahad Edrees, MD, and Tingting Li, MD, authored an article in *Advances in Chronic Kidney Disease* that described their success with PIRRT, both in terms of patient care benefits and nursing convenience.

“Critically ill patients with AKI are initially started on CRRT and, as they get better, they transition to PIRRT at night,” explains Vijayan. “It allows patients to be more mobile during the day so that they can participate in therapy or be taken for imaging studies or other procedures. It also frees up nursing time because one nurse can set up and monitor four PIRRT machines versus having one-on-one nursing care as for an IHD patient.”



Anitha Vijayan, MD, discusses renal replacement options with nephrology fellows.

Vijayan advocates for the establishment of international prescription and dosing guidelines as well as for standardized terminology for PIRRT. “We need to better understand both the dose and timing of certain medications, especially antibiotics, in relation to PIRRT, and how it impacts patient outcome,” she says.

She adds, “Having different modalities of RRT does involve more complicated oversight, but the benefits to patients are obvious. Also, for the fellows in our training program, they now have exposure to all the RRT options available to ICU patients and can consider implementing this in their practice, wherever they go along their career path.”

## 3rd Annual St. Louis City-Wide Renal Grand Rounds

The 3rd Annual Paul Mennes, MD, Memorial St. Louis City-wide Renal Grand Rounds in late October brought an internationally respected nephrologist to town. **Richard Glassock, MD, MACP**, addressed a full house of renal specialists in the region and spoke on the topic of *ANCA-Associated Vasculitis: Clinical Manifestations and Immunopathogenesis*.

Dr. Glassock is one of the most prominent experts in the field of glomerular



Richard Glassock, MD

diseases and clinical nephrology and has published more than 600 peer-reviewed articles, books, book chapters and reviews over the course of his career. He is an Emeritus Professor of Medicine at the David Geffen School of Medicine at UCLA and is the past-president of the American Society of Nephrology and the National Kidney Foundation.

He also is a past-Chairman of the American Board of Internal Medicine.

Dr. Glassock’s lecture is the latest example of the resurgence and prominence of the

City-Wide Renal Rounds. “City-Wide Renal Rounds has been extremely well received, not only by the Washington University and Saint Louis University academic nephrologists and trainees, but also by the private practice nephrology community in St. Louis and the surrounding region,” says Benjamin Humphreys, MD, PhD, chief of the Division of Nephrology. “Many of these practitioners graduated from one of our two programs, and the event has a very collegial atmosphere where participants can catch up with one another while discussing challenging nephrology cases or recent advances in care.”

# Research Highlights

## Good Cell/Bad Cell

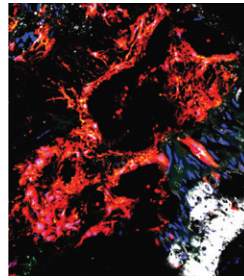
### Washington University Research led by Benjamin Humphreys may help scientists find ways to prevent hardening of arteries

About 20 million adults in the U.S. have some degree of chronic kidney disease, according to the Centers for Disease Control and Prevention. But most of these patients never develop the need for dialysis or kidney transplantation because they succumb to cardiovascular disease first.

Benjamin D. Humphreys, MD, PhD, director of the Division of Nephrology and an associate professor of medicine, led Washington University School of Medicine researchers in finding that Gli1 stem cells deposit calcium in the arteries. This creates calcification of blood vessels common in patients with chronic kidney disease.

“In the past, this calcification process was viewed as passive — just mineral deposits that stick to the walls of vessels, like minerals sticking to the walls of water pipes,” said Humphreys. “More recently, we’ve learned that calcification is an active process directed by cells.”

GLi1 cells have been named the culprit that clogs blood vessels with mineral deposits. Humphreys and his colleagues showed that in healthy conditions, Gli1 cells play an important role in healing damaged blood vessels by becoming new smooth muscle cells, which give arteries their ability to



contract. But with chronic kidney disease, these cells become a type of bone-building cell called an osteoblast, which is responsible for depositing calcium. Humphreys noted that “During kidney failure, blood pressure is high and toxins build up in the blood, promoting inflammation. These cells may be trying to perform their healing role in responding to injury signals, but the toxic, inflammatory environment somehow misguides them into the wrong cell type.”

Now that GLi1 cells have been identified as responsible for depositing calcium, Humphreys and his team can begin testing ways to block the process. “But we have to be careful because we believe these cells also play a role in healing injured smooth muscle in blood vessels, which we don’t want to interfere with.”

## Decreasing Catheter-Related Blood Stream Infections

A study is under way at Forest Park Kidney Center to see if tighter infection controls and the use of a special catheter cap will decrease the incidences of catheter-related

blood stream infections (CRBSI) in dialysis patients. All patients with catheters and central IV lines are at risk for infections. While minimizing catheter use is a primary goal, it’s challenging in dialysis patients. Earlier this year, thanks to a division micro-grant, the dialysis team began testing a new type of catheter disinfecting cap as a way to decrease the risk of CRBSI. “Patient care staff were trained in the proper use of the cap and we tracked both aseptic techniques and the infection rate,” says Patricia Anderson, RN, Nurse Administrator at the kidney center. “In the first four months, CRBSI rates dropped significantly.”

Further studies are needed says nephrologist Dave Windus, MD, Medical Director of Dialysis Services, but the focus on reducing CRBSIs is critical. “These infections can lead not only to hospitalization, 3-6 week courses of antibiotics, and potentially, death, but also infections at other sites, such as bone and heart valves,” he says. “We still see some infections despite the use of devices such as a catheter disinfecting cap. Additional data is needed, but in the meantime, we need to identify other causes of these infections and minimize the use of catheters overall as much as possible.”



“Eduardo is a true triple threat,” notes Division Chief Dr. Benjamin Humphreys. “He is a gifted scientist, teacher and physician. We are grateful for his commitment to our division.”

Earlier this year, the division held the Slatopolsky Scientific Symposium. It was a day of science and an evening of fun to celebrate Dr. Slatopolsky’s career. Even “El Macho” the rooster was in attendance, complete with bow.

understanding of the pathophysiology of secondary hyperparathyroidism, hyperphosphatemia and vitamin D biology. Dr. Slatopolsky served as Director of the Chromalloy American Kidney Center at Barnes-Jewish Hospital for 30 years. He was a post-doctoral trainee in the Division of Nephrology in 1963.

## Eduardo Slatopolsky To Receive NKF Award of Excellence

The National Kidney Foundation has honored Eduardo Slatopolsky, MD, Professor Emeritus of Division of Nephrology, with its 2016 Award of Excellence.

The award, which was given at the 30th Annual NKF Gala in St. Louis on November 12, 2016, honors Dr. Slatopolsky for his contributions to the



Eduardo Slatopolsky, MD

understanding of the pathophysiology of secondary hyperparathyroidism, hyperphosphatemia and vitamin D biology.

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# Faculty News and Awards

## Yau Named Practice of Medicine Coursemaster

Timothy Yau, MD, assistant professor of medicine in the Division of Nephrology, has been selected as the new Practice of Medicine I and III coursemaster at Washington University School of Medicine. As such, he oversees the clinical skills education of all first-year medical students and directs a monthly lecture series for third-year students. The course also encompasses humanities, medical ethics, public health,

scientific methods and quality improvement.

“I’ve always enjoyed working with students,” says Yau. “To be able to make an impact and see them mature from their literal first day of medical school is something extraordinary. The Practice of Medicine course is particularly complex and challenging because of its longitudinal nature throughout all four years of training, but we have amazing faculty members here that continue to contribute their time to make it a memo-

orable experience for the students.”

Yau is an engaging and prolific educator and is the creator of the widely popular and nationally recognized Washington University Nephrology Web Series on YouTube. He currently serves as an instructor in the second-year Renal and Genitourinary Diseases course as well as the fourth-year Capstone course. In addition, he is a two-time recipient of



Timothy Yau, MD

WU’s Distinguished Service Teaching Award. Later this month, he will be honored at the American Society of Nephrology Meeting in Chicago as one of three winners of the ASN’s 2016 Innovations in Kidney Education contest.

## Best Renal Docs

Five physicians from the Nephrology Division have been named among *Best Doctors in America*. We congratulate Drs. Daniel Brennan, Daniel Coyne, Tingting Li, Marcos Rothstein and Dave Windus. The national list is compiled from a Gallup survey of nephrologists across the country.

impair regenerative response after acute kidney injury, particularly in aging.

### Yong-Feng Gong, MD, PhD, Instructor

Gong joins the faculty after serving as a postdoctoral fellow in cell biology and physiology at Washington University School of Medicine. She earned her medical degree from Binzhou Medical University and her doctorate degree in cell biology and physiology from Zhejiang University in China. She has been an Instructor of Medicine at Washington University since 2015.

for Biomedical Research in Cambridge, MA.

### Anuja Java, MD, Instructor

Java joined the faculty after serving as a postdoctoral fellow in John Atkinson’s lab at Washington University School of Medicine for the past three years. She earned her MBBS at the Government Medical College in Nagpur, India, and completed fellowships in nephrology at the University of Oklahoma Health Sciences Center and in transplant nephrology at Washington University School of Medicine.

### Eirini Kefalogianni, PhD, Instructor

Kefalogianni earned her PhD in Physiology/Cellular Signaling from the University of Athens School of Biology. She previously served as a postdoctoral fellow at New York University School of Medicine and Harvard Medical School.

## New Faculty

The Division of Nephrology welcomes the following new faculty:

### Monica Chang-Panesso, MD, Instructor

Chang-Panesso received her medical degree from Texas Tech University School of Medicine and completed her nephrology fellowship at the Brigham and Women’s Hospital/Massachusetts General Hospital. She is a member of the Humphreys Lab and is interested in studying the molecular mechanisms that

### Andreas Herrlich, MD, PhD, Associate Professor

Herrlich was an assistant professor of medicine at Harvard Medical School prior to joining the Division. He earned his MD/PhD from Freie University in Berlin, Germany and completed both a clinical and research renal fellowship at Harvard as well as postgraduate research at Whitehead Institute

### Patricia Kao, MD, MS, Associate Professor

Kao comes to Washington University after serving as assistant professor of medicine and director of the Nephrology Fellowship Program at Eastern Virginia Medical School in Norfolk, VA. She earned her medical degree and completed her clinical fellowship in nephrology at Case Western Reserve University School of Medicine.

### Dennis Littleton, ANP

Littleton earned his BSN and a master’s degree in Adult Gerontology Primary Care from Barnes-Jewish College Goldfarb School of Nursing. His primary role in the division is the management of inpatient renal failure and dialysis patients.

### Hani Suleiman, MD, PhD, Instructor

Suleiman earned his medical degree from Damascus University School of Medicine in Syria in 1999 and his doctorate degree from the University of Regensburg in Germany in 2007. He received the Neph-Cure Young Investigator Award in 2014.

## Elevator Shenanigans

If you think our division doesn't have fun at least some of the time, check out this selfie — all three general nephrology consult teams just happened to be in one elevator at the same time! Hope it brings back memories of your fun times when you were a fellow in our division, as well.

The three consult teams accidentally took the same elevator after completing teaching rounds. All three groups were headed to pathology to review slides.

"It may not be a very professional picture," laughs Steven Cheng, MD, Director of the Nephrology Fellowship Program, who is in the back of the photo with his hands raised high. "The picture, however, very much captures the fun vibe our teams have been having."

*Do you have a fun memory about your time in the division? Send us an email to [Virginia.Kelly@wustl.edu](mailto:Virginia.Kelly@wustl.edu).*

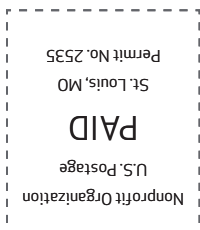


Front: Karthikeyan Venkatachalam, MD, 2nd year fellow taking the selfie; Deepa Amberker, MD, 1st year fellow; Alex Thomas, MD, 2nd year internal medicine resident doing renal elective; Will Ross, MD, MPH, Professor of Medicine.

Middle: Sreelatha Katari, MD, 1st year fellow; Daphne Xiao, 4th year medical student, and Janice Kim, 4th

year medical student, both doing an elective in nephrology; Owais Bhatti, MD, 1st year fellow.

Back: David Windus, MD, FACP Professor of Medicine, Nephrology/Internal Medicine; Steven Cheng, MD, Professor of Medicine, Nephrology/Internal Medicine; Frank Zhang, MD, 2nd year fellow; Nurelign Abebe, MD, 2nd year fellow.



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