Dr. Jennifer Philips MD, PhD new co-director of the Infectious Diseases Division

Dr. Jennifer Philips MD, PhD, has accepted the position as Co-Director of the Division of Infectious Diseases, in the Department of Medicine. Dr. William Powderly will continue as Co-Director of the Division overseeing the clinical faculty, operations, research and educational programs. Dr. Philips will take over for Dr. Daniel Goldberg, leading the basic research faculty, physician-scientist trainees and wet lab research programs in the Infectious Diseases Division. Dr. Goldberg, The David M. and Paula L. Kipnis Distinguished Professor of Medicine and Professor of Molecular Microbiology, has been the Co-Director of the Infectious Diseases Division since 2000, and the head of the microbial Pathogenesis Training Grant since 2004. Dr. Goldberg has served in many important roles at Washington University including heading the medical scientist training program (MSTP) for many years, and serving in multiple leadership roles in the Division of Biology and Biomedical Sciences. Given his long-standing service to research administration and graduate training, it is important that we now provide Dr. Goldberg the pleasure of focusing on his laboratory and transition the ID leadership to another outstanding physician scientist, Dr. Jen Philips.

Gerald Medoff, MD, FIDSA (1937-2019)

Gerald Medoff, MD, FIDSA, an emeritus professor of medicine and former director of the Division of Infectious Diseases and vice chair of medicine at Washington University School of Medicine in St. Louis, died peacefully Monday, Jan. 14, following a long battle with Parkinson’s disease.

The next issue of the ID newsletter will be dedicated to Dr. Medoff. We would like to include stories of your experiences with Dr. Medoff as a mentor. They can be of challenging moments, inspirational, funny, life-changing or career development influenced by Dr. Medoff. Submit them to us and we will share your story.

Send them to Susan Wightman at wightman.susan@wustl.edu or Bill Powderly, MD at wpowderly@wustl.edu.
Since completing my ID fellowship in 2004, I have been working at the Cleveland Clinic. The past 4-5 years have focused on patient care. My clinical practice primarily consists of inpatient ID consults and HIV clinic.

As the Cleveland Clinic is a referral center, we have the opportunity to see interesting and complex cases. In addition, I have focused on bone and joint infections.

HIV-wise, I am using the skills gained from my ID fellowship at Washington University to head our HIV section and serve as principal investigator of the Cleveland Clinic Ryan White Grant, which helps to provide a comprehensive system of care that includes primary medical care and essential support services for people living with HIV.

The years since my fellowship have just flown by. Much of it was just a blur of balancing single motherhood with work responsibilities. My daughter Emma was born during my ID fellowship. It’s hard to believe that she is now almost 16 years old and learning to drive. She is enjoying high school, writing for her school newspaper, and singing in choir and musicals.

In 2014, Jeff and I got married. We love living in Cleveland. It is such a lovely place to raise a family. However, it’s possible that the great state of Missouri may be in our futures again. My parents have already started heavily recruiting Emma for college in St. Louis, to be near them.
## RECENT GRANT AWARDS

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**Robyn Klein, MD, PhD, neuroimmunologist promotes diversity in science**

In 2016, as Robyn Klein, MD, PhD, and Jessica Williams, PhD, then a postdoctoral fellow in Klein’s lab, looked over the program for an upcoming international neuroimmunology meeting they were planning to attend, one thing jumped out at them: Only 13 of the 85 invited speakers were women. “Robyn told me later that she just couldn’t get past the look on my face when I saw how few women there were,” Williams said. “So within the next week, she decided to take a stand.”

Klein, vice provost and associate dean for graduate education for the Division of Biology & Biomedical Sciences at Washington University in St. Louis, emailed the organizers to demand an explanation. One wrote back to say that simply weren’t as many accomplished women.

“That really got to her,” said Anne Cross, MD, a professor of neurology and a longtime collaborator of Klein’s. “So she contacted all of her friends in neuroimmunology – men and women – and came up with a game plan to figure out whether there aren’t as many qualified women as men in the field. And she showed, pretty conclusively, that it wasn’t true.” Her findings prodded the conference organizers to double the number of female speakers. Klein continued to investigate, eventually publishing a paper in Nature Immunology showing accomplished female scientists are rou-

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MATT MILLER Robyn Klein (right) shares a laugh in the lab with graduate student Allison Soung.

*continued page 4*
It was the latest skirmish in Klein's lifelong battle against the idea that women don't belong in science. Today, she is a recognized expert on the brain's immune system, and a founder and director of the university's Center for Neuroimmunology and Neuroinfectious Diseases. But at one time, she was a bright kid growing up in a family and a community where she was told that girls didn't do science.

“It was difficult for me to decide to become a scientist, because I had been raised to believe that science wasn't a suitable path for me,” said Klein, a professor of medicine, of pathology and immunology, and of neuroscience. “I had very negative interactions with some male science teachers in school. My family made it clear that it would be more appropriate for me to pursue some of my other interests, like writing.”

Klein, who grew up in New Rochelle, N.Y., just north of New York City, felt hemmed in by such ideas. When she heard, while still in middle school, that Barnard College was hosting an informational session at her high school, she hopped on her bike and rode over. The all-women's school in New York City was well-known in Klein's hometown.

“I went running up the stairs and ran in and said, 'What do I need to do to get in to this school?'” Klein recalled. “And they said, 'How old are you?' But then they told me everything I had to do, and over the next few years I did it. Even then, I knew that I needed to go to a women's college, where I could unlearn these ideas I was hearing from everyone. I knew they were wrong. They were wrong about me, and they were wrong about the world.”

The go-getter attitude that set her on the path to Barnard at age 14 has served her well throughout her career. She developed an educational path for herself in neuroimmunology – a PhD in neuroscience, followed by a residency in internal medicine, where she learned about the immune system, and a fellowship in infectious diseases – at a time when the field itself was just emerging and no clear training path existed for interested young physician-scientists.

When Klein was in medical school at Albert Einstein College of Medicine, conventional wisdom held that the immune system steered clear of the brain. The blood-brain barrier was sufficient to keep microbes and toxins out, she was told, and immune cells in the brain were a bad sign, a marker of the neurological disease multiple sclerosis.

“When I started on the medical wards as a medical student, it was in the middle of the HIV epidemic in New York City,” Klein said. “So many of our patients were young people dying of AIDS, and a lot of them had infections of the brain.”

As she made her rounds treating people whose immune systems had been decimated by AIDS and brains ravaged by other opportunistic infections, she realized that a healthy immune system must be a crucial part of the brain's defenses. But to her surprise, very little work was being done on how the immune system protects the brain under normal conditions.

So she tackled the question herself. For her postdoctoral training she chose an immunology lab and began studying HIV infection of the central nervous system. Not long after she started, though, a bombshell paper came out reporting the discovery of a second receptor that HIV uses to get inside cells. The primary receptor had been discovered years before, and its location on immune cells explained why the virus destroyed one branch of the immune system. Now a secondary receptor had been found. But what did it mean?

Klein had a hunch. The secondary receptor was the docking site for immune messenger molecules known as chemokines. Many neurons had

continued page 5
similar docking sites, she knew. “I thought these receptors had to be all over the brain,” Klein said. “I said to myself, ‘This must be the link between the nervous system and the immune system.’”

As it happened, her husband, Joshua Rubin, MD, PhD, now a professor of pediatrics at the School of Medicine, was doing his postdoctoral fellowship in a neurology lab that studied such chemokine docking sites. He faxed her a protocol for growing neurons, Klein switched labs to one that focused on chemokines, and the two began to study how chemokines affect neurons, much to the bemusement of their mentors. The idea that immune messenger molecules might influence the behavior of neurons boggled the minds of both immunologists and neurologists.

“Soon we had a paper, and we put it together and showed it to our mentors, and they said, ‘We don’t even know what you’re doing,’” Klein said. Published in the journal Development in 2001, the paper showed that chemokines influenced the ability of developing neurons to multiply and migrate, indicating that the immune system plays an important role in the normal behavior of the nervous system. The paper has been cited hundreds of times.

Klein and Rubin had not collaborated on a paper before, even though they had been working in related fields since they met in a graduate neuroscience class a decade before. He was older than her but a year behind her in their MD/PhD program, as he had spent five years after college playing Irish folk music professionally.

The two have been together more than 20 years. They are raising two daughters, Nisha, 18, and Sophia, 13, in an old house in Webster Groves. They have furnished their home with antiques discovered at stores all over St. Louis and further afield. An exquisite green Roseville basin on a pedestal is one of their most prized finds.

To her daughters, Klein is more the absentminded professor than the brilliant scientist. She has been known to wear her bike helmet backwards. She sometimes forgets what her car looks like, mistakenly wandering over to a stranger’s car as the girls watch and laugh. “I’ve always done things like that,” Klein said. “My family used to tease me about it when I was growing up, and now my daughters make fun of me. It’s because I’ve got something else I’m thinking about, some problem I’m processing.”

Much of the time, the problem she is processing has to do with how immune cells get through the blood-brain barrier to enter the brain, and their effect on brain cells once they arrive. In recent years, she has been untangling the destructive role of the immune system in brain infections caused by West Nile virus. Her work suggests that out-of-control inflammation could explain why some people struggle with memory loss long after the virus is cleared.

“Robyn has a remarkable ability to apply an interdisciplinary approach across multiple fields – neurology, immunology, microbiology,” said Michael S. Diamond, MD, PhD, the Herbert S. Gasser Professor of Medicine. Diamond advocated for recruiting Klein to the School of Medicine in 2003.

“We recruited her because she was an excellent scientist who was working on questions of neuroinflammation in the context of multiple sclerosis, and we were hoping she also would begin to look at viral infections in the brain, which she has,” Diamond said. “She’s been an outstanding colleague. She’s broadened our science and allowed us to tackle key questions that we would not have been able to answer without her.” Klein herself will tell you that she’s had many mentors who’ve smoothed her path to success, starting with a middle school biology teacher with whom she’s still in touch. In her role with DBBS, she is now in a position to return that favor for a whole generation of young scientists. She is
working on initiatives to help graduate students learn about scientific career options outside of academia. And she takes care to address the special hurdles that face women and underrepresented minorities in the sciences.

"Improving diversity requires deep service," Klein said. "You have to put your heart into it and know that it’s right because overlooking women and minorities reduces excellence and impact. If you want to capture all the talents of humanity you have to include all of humanity."

To Cross, Klein’s legacy of encouraging young scientists of diverse backgrounds may be as important as her scientific contributions. "She’s always been very adamant about involving young people and women and minorities, giving them a chance to shine," Cross said. "There’s something called ‘stereotype threat,’ when people are interested in a career but they see that they don’t fit into the stereotype for that career, and it discourages them. That’s why it’s important to see someone like themselves up on stage. She’s taken on that issue with a go-get-it attitude, and I think she’s really done some good."

Original Source: Washington University School of Medicine. By Tamara Bhandari

Makedonka Mitreva leads WashU team to quantum leap in parasite worm genetic research with largest ever comparative study

Parasitic roundworms and flatworms (collectively known as “helminths”) cause some of the most common yet neglected tropical infectious diseases affecting more than a billion people worldwide, in addition to afflicting many important plants and animals. Such diseases include chronic and sometimes severely painful and physically disabling conditions like river blindness, schistosomiasis and hookworm infections.

Now, research led by an international team of scientists involving the largest study of helminth genomes to date is helping us to understand their biology and will accelerate our progress towards finding novel and more effective ways of fighting these parasites.

"Over the last decade helminth genomes have been studied in fits and starts all over the globe and there clearly was a need to have a large-scale effort to look at these parasites collectively. So we decided to join hands with other leading researchers around the world and tackle this formidable task. Studies like this enable translational research in tropical medicine and are vital for improving global public health," said Dr. Makedonka Mitreva who led the team from Washington University’s McDonnell Genome Institute.

In addition to the team at Washington University, the consortium comprised of leading helminth genomics researchers from the Wellcome Sanger Institute (led by Drs. Matt Berriman and Avril Coghlan) and The University of Edinburgh (led by Dr. Mark Blaxter) in England, along with many other collaborators worldwide. Together, they have discovered nearly a million new genes belonging to thousands of novel gene families many of which are likely to have important functions for parasite survival, development or to help them evade the immune system.

Scientists from Dr. Mitreva’s lab, including Drs. Rahul Tyagi and Bruce Rosa, analyzed the 1.4 million genes and determined that, interestingly,
Gary Weil, MD, receives a $2.1 million grant from the Bill & Melinda Gates Foundation

Infectious disease specialist Gary Weil, MD, at the School of Medicine, has received a $2.1 million grant from the Bill & Melinda Gates Foundation to lead a clinical trial in eastern Ghana to evaluate a triple drug combination for treating onchocerciasis, a parasitic worm disease also called river blindness. The researchers want to determine whether timing of giving the drug combination is more effective than the standard treatment in killing the worms, which infect the eyes and can lead to vision problems and blindness if left untreated.

Prior studies conducted by DOLF (Death to Onchocerciasis and Lymphatic Filariasis) have shown that this combination is safe and effective for treatment of lymphatic filariasis (also known as “Elephantiasis”). This disease is caused by a worm parasite W. bancrofti which is closely related to the worm O. volvulus that causes onchocerciasis.
Rupa Patel, MD, MPH, DTM&H among three St. Louisans selected to national list of influential young executives

Dr. Patel of Washington University School of Medicine, Mark Bini of Express Scripts, and Amy Schnettgoecke of Emerson have been selected to a national list of influential young executives. The Business Journals' Influencers: Rising Stars spotlights 100 people in business across the country who are having an impact relatively early in their careers on their companies and their communities. And, because they're still early in their careers, these executives could be shaping how business gets done in cities across the country for years to come.

Bini, Schnettgoecke, Patel and the rest of the Influencers: Rising Stars were identified in conjunction with editors and staff writers across The Business Journals' network of more than 40 publications, including the St. Louis Business Journal. The first-of-its kind list draws in large part from the various Forty Under 40 profiles and similar efforts produced by The Business Journals publications over the past year.

From that initial pool of well more than 1,000 executives who've been profiled locally over the past 12 months, the field was narrowed to ultimately spotlight the 100 executives featured for Rising Stars.

Dr. Patel is an assistant professor medicine, Infectious Diseases Division, and has been recognized for launching the HIV prevention clinic at Washington University School of Medicine.

Patel invited to participate in WUSTL TEDx event March 1, 2019

Rupa Patel, MD, MPH, DTM&H, assistant professor of medicine is among three invited Washington University faculty to give a talk at the annual TEDx event. TED is a nonprofit organization devoted to Ideas Worth Spreading. TEDx is a program of local, self-organized events that bring people together to share a TED-like experience. At a TEDx event, TED Talks video and live speakers combine to spark deep discussion and connection. Dr. Patel will be discussing Diversity & Inclusion and Pre-exposure Prophylaxis (PrEP). The event will be at the George Warren Brown School of Social Work at Washington University St. Louis.
Caline Mattar and Indi Trehan, co-directors of a program that teaches medical trainees how to provide care in developing countries

A starved supply closet and a lack of basic necessities such as electricity or running water pose significant health risks to patients at medical clinics in poverty-stricken parts of the world, sometimes even more so than illness or disease.

“Many of these patients suffer from common or preventable illnesses that we can routinely and successfully treat in the U.S.,” said Indi Trehan, MD, MPH, an associate professor of pediatrics at Washington University School of Medicine in St. Louis who has worked on and off for 11 years in bare-bones clinics and hospitals in Africa and Southeast Asia. “But in resource-limited countries, you have to work with what you have, which often isn’t much.”

Trehan reiterated this lesson throughout a recent, two-week course on global health that was designed to prepare medical students, residents and fellows for clinical rotations and long-term careers in developing countries. Caring for such patients requires a different mind-set for trainees accustomed to working in modern medical centers with updated technology, well-stocked supply closets and access to a full range of medications dispersed by pharmacists who calculate proper dosages. “You may not have simple things such as urine dipsticks to check glucose in a diabetic, or you will have to know how to count drips and adjust control valves for IV drips because they’re not computerized,” said Trehan, who is the medical director at Lao Friends Hospital for Children in Luang Prabang, Laos.

Trehan co-founded the global health seminar four years ago with Rupa Patel, MD, an assistant professor of medicine in the Infectious Diseases Division. “It is essential for trainees interested in global health to understand the challenges of delivering care in resource-limited settings,” said Caline Mattar, MD, currently co-director of the program with Trehan and an assistant professor in the Division of Infectious Diseases. She also oversees the university’s Global Health Scholars Pathway for Internal Medicine and the Global Health Track for Infectious Diseases.

“It’s also important that they are sensitive to their patients’ cultures and the ethics surrounding research and clinical rotations, as well as to social determinants of health,” Mattar said. The latter refers to social and economic factors that may contribute significantly to negative health outcomes. “Global is also local, and here in St. Louis, we witness firsthand the health inequities a few blocks away from our campus,” Mattar said. “Our goal through this course is to expose our trainees to the challenges both abroad and here, so that they are better equipped to tackle social determinants and inequalities in their daily practice.”

Throughout the course, Trehan emphasized that making substantial improvements in global health do not always require costly, high-tech treatments or technologies. Rather, health often can improve with education, better nutrition and increased affordable access to simple proven interventions. Diabetics can lead healthier lives if their insulin is stored properly. Tropical temperatures can reduce insulin potency, posing serious health risks to diabetic patients who lack access to refrigeration. “We show patients that stashing insulin in a banana tree can keep it cool enough to stay effective,” Trehan said.

For Colleen Walsh Lang, a fourth-year medical student, the course reinvigorated her long-standing interest in global health. Since 2006, she has been to Uganda half a dozen times, working with HIV-infected children. “I appreciated learning about the challenges physicians face when supplies are unavailable or outdated and require ingenuity to make things work. “In a clinical simulation setting, we were expected to be a doctor and perform tasks that nurses or pharmacists do in most U.S. clinics,” said Michael Ripple, a pediatrics resident at St. Louis Children’s Hospital. “It was humbling to think about what it would be like as the only health-care worker in a clinic. These are skills that make us better physicians, no matter where we practice.”

Adapted from Original Source: Washington University School of Medicine. By Kristina Sauerwein
Jennie H. Kwon, DO, MSCI, appointed Chair of SHEA Awards Committee

Jennie H. Kwon, DO, MSCI, an assistant professor of medicine, Infectious Diseases, recently accepted a three year appointment of the Society of Healthcare Epidemiology (SHEA) awards committee. Dr. Kwon will chair the committee that oversees annual career recognition awards during IDWeek.

Stephen Liang Deployed with the Missouri Task Force 1 - in Response to East Coast Hurricanes

Stephen Liang, MD, MPHSc, assistant professor of medicine, joined Missouri Task Force 1 (MO-TF1) in 2011 as a medical team manager, and has traveled to many sites helping disaster victims and their communities. When Hurricane Florence hit in September 2018, MO-TF1 was activated by the Federal Emergency Management Agency to deploy as a type III urban search and rescue team to Brunswick County, North Carolina. Florence had already taken more than a dozen lives and left hundreds without homes and thousands without power.

MO-TF1 worked through torrential downpour, several tornado warnings, and widespread flooding. In total, MO-TF1 rescued/evacuated 394 people and 33 animals and conducted wellness checks on 1,374 residents that remained in their homes. The team used boats and high-water vehicles to get to those who needed their help. “We found people in vehicles, flooded subdivisions, wires down, trees down, and power outages for days,” said Task Force Leader, Randy Sanders.

Dr. Liang was deployed with MO-TF1 for 19 days before returning home to his wife, Philana, a physician assistant in the Washington University ID clinic, and their four children. Stephen is tremendously grateful to the leadership, faculty, and staff of the Divisions of Infectious Diseases and Emergency Medicine for their support during this deployment. “It is an honor to care for the dedicated first responders of MO-TF1 and help others in a time of need,” said Stephen.

Laura Marks, MD, PhD, second year fellow: The opioid epidemic has increased hospital admissions for serious infections related to opioid abuse. This study demonstrated that addiction medicine consultation is associated with increased treatment for opioid use disorder (OUD), greater likelihood of completing antimicrobial therapy, and reduced readmission rates among patients with OUD and serious infections requiring hospitalization. Comprehensive care should include working with our addiction medicine colleagues to address root causes.


Steven Liang, MD: Infectious complications related to deployment trauma significantly contribute to the morbidity and mortality impacting wounded service members. The Trauma Infectious Disease Outcomes Study (TIDOS) collects data on U.S. military personnel injured in Iraq and Afghanistan in an observational cohort study of infectious complications. In this analysis of the first 337 TIDOS enrollees to receive VA healthcare, we found that deployment-related trauma infectious complications continue long after the initial injury. Overall, 38% of enrolled patients developed a new trauma-related infection after their initial hospital discharge with 29% occurring after the patient left military service. Injury severity and occurrence of ≥1 inpatient infection were associated with a shorter time to development of a new post-discharge infection.


Anne Mobley Butler, PhD, MS: Using data from the United States Renal Data System (2010-2013), we performed a cohort study to characterize the national uptake of high-dose influenza vaccine in adult patients with end-stage renal disease (ESRD) on hemodialysis (N=421,482). We examined temporal trends and predictors of high-dose influenza vaccine use. Between 2010 and 2013, the proportion of patients vaccinated with any influenza vaccine increased from 68.3% to 72.4%. However, the increase in high-dose vaccine use only increased from 0.3% to 1.3%. Facility-level factors, including receipt of care at hospital-based dialysis clinics and geographic region, were the strongest predictors of receiving a high-dose influenza vaccine. Several patient-level factors were also associated with high-dose influenza vaccine receipt including older age, white race, and incident dialysis use. Since previous effectiveness studies have demonstrated that standard influenza vaccines provide little benefit in preventing influenza-related outcomes in dialysis patients, our findings are important to inform study design and analytic approaches for ongoing comparative effectiveness and safety studies of the high-dose versus standard-dose influenza vaccines in the dialysis population.
Our mission is to provide outstanding clinical care, conduct ground-breaking research, and train the next generation of leaders in academic medicine and infectious diseases.

Dr. Gerald Medoff has been among the most influential leaders in the School of Medicine in the past half century, and the contributions of Dr. Medoff to the field of medicine are clearly reflected in the quality of the School and in the extraordinary individuals he has mentored. It is therefore only appropriate that we honor him by creating a fund that will provide support for young trainees and junior faculty in the Division, helping them transition their independent careers. Additionally, we rely heavily on outside donations to continue to recruit, train, and retain high quality staff to support the research, education, and clinical mission of the division.

We believe that you share our sense of pride in what we have been able to build, much of which is due to the leadership of Dr. Medoff. To make a gift online please visit the Washington University “LEADING Together” page and designate your gift to honor Dr. Medoff to the Division of Infectious Disease Fund (90991).

Thank you to our recent donors

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To make a gift to the Infectious Diseases Division, you may contact JoAnne Couch, MS, Business Director, Infectious Diseases Division, or mail your contribution. Checks can be made payable to:

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