Patel recognized in Business Journal’s ‘40 Under 40’

Dr. Rupa Patel was honored for her expertise in infectious diseases and her vital work in the St. Louis region for making great strides in shaping the community’s future.

After reviewing more than 500 nominations, the St. Louis Business Journal unveiled its list of 40 Under 40 honorees for 2018. Rupa Patel, MD, MPH, DTM&H, assistant professor of medicine, is among the class of young professionals acknowledged to be vital to our region and for making great strides in shaping our community’s future.

A panel of previous 40 Under 40 winners helped the Business Journal select the latest class. Some of the area’s biggest companies are represented on the list — such as Monsanto, Express Scripts, Centene and Mastercard — along with a wide range of entrepreneurs and small business owners from a variety of industries in the area, including healthcare.

Dr. Patel was recognized primarily for her work in HIV, more specifically for launching an HIV prevention clinic at Washington University, implementing pre-exposure prophylaxis (PrEP).

Dr. William Powderly, co-director of the Infectious Diseases, recruited Patel to start a PrEP clinic. Launched in June 2014, the PrEP Clinic often provides free care, and has seen about 320 patients. “Rupa successfully established relationships of trust and links into the community that have meant that not only is the quality of the program superb, but it’s also accessible and available to everybody,” Powderly said. “She’s exceeded our expectations, and has great drive and determination.”

Rupa’s involvement in PrEP has landed her a consulting position to the DREAMS Project in...
After finishing the ID fellowship at WashU in 2011, I completed my J1 waiver program in Mississippi. I then began work on the Master’s in Public Health at Johns Hopkins University/Bloomberg School of Public Health. I moved to Long Island (NY) in 2015 and was appointed Associate Professor of Medicine in the Division of Infectious Diseases at Stony Brook University (SUNY). After two years, I became the program director for the Fellowship Program and the associate director for Research in the Global Health Institute.

As part of my academic and research activities, research overseas in Tropical Medicine has become a true dream for me. I am currently in my third year of research in soil-transmitted helminthiasis in the remote villages around the Ranomafana National Park in Madagascar.

Due to my interests in vector borne diseases, I became the local Director for the Tick Borne Disease Center at Stony Brook University where, in addition, I started a Biorepository of infectious diseases samples. I love my job as clinical educator, translational researcher and promoting global health locally and overseas.

My wife Claudia, daughter Chantal and I live in a nice, quiet neighborhood in the North Shore of Long Island. Chantal is a bright, seven-year old girl, fully bilingual and an avid chess player. We remind and tell her stories about the Gateway city where she was born. To my old friends in St. Louis I send you my best and don’t forget or hesitate to give me a buzz when you visit New York.

Patel

Namibia, one of 10 African countries participating. DREAMS is an ambitious partnership to reduce HIV infections among adolescent girls and young women in 10 sub-Saharan African countries. The goal of DREAMS is to help girls develop into Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe women.

In January of this year, Dr. Patel traveled to Namibia. Her roles were to address the government of Namibia, develop a national standard operating procedure for ministry of health clinics, outlining next steps for PrEP implementation for the country and leading meetings of stakeholders on a national monitoring plan.

Dr. Patel also trained lead medical doctors and nurses for the country who serve as mentors to other clinics. She was involved in implementation of PrEP as a one-stop, same day PrEP model for the country within two large ministries of health (MOH) clinics. She also created models for family planning and antenatal clinic PrEP delivery in a Christian cultural environment. She also took part in training 18-22 year old female mentors who serve to mentor 10-18 year old girls so that they can make health choices about sex and have a safe person to speak to about these issues.

“It was a privilege to be a part of such a large project and network with so many countries and be a lead expert for a country”, says Patel. “This is the first time I had been involved in a HIV prevention project where there is massive structural interventions and work so closely with a country government.”

Dr. Patel was also selected as a national finalist for the White House Fellows Program 2017-2018. The White House Fellows program was designed “to give the fellows first hand, high-level experience with the workings of the Federal government and to increase their sense of participation in national affairs.”

National Finalists have demonstrated a commitment to public service, and the leadership skills needed to succeed at the highest levels of the Federal government.

There were over 1000 applicants of which 30 national finalists were selected to be interviewed. “This was an incredible learning experience in which I had to formulate a policy agenda around PrEP and present it to White House Staff” says Patel. “I was pushed to think in creative ways regarding the priorities in health care spending and the economics of scaling up biomedical HIV prevention.”

Although Dr. Patel was not selected to the 2017-2018 Class of White House Fellows, we recognize her tremendous achievement as a finalist!
awards & announcements

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**special recognition**

**Gerome Escota, MD**, assistant professor, was selected by the current infectious diseases fellows to receive the 2018 J. Russell Little Clinical Education Award. The award is given to a faculty member for their outstanding clinical teaching and honors Dr. Little for his years of practice and teaching at the Washington University School of Medicine. Dr. Little joined Washington University faculty on July 1, 1964 and became head of Infectious Diseases Division at The Jewish Hospital of St. Louis. After the hospital mergers of Barnes and Jewish Hospitals, Little continued his life-long career in infectious diseases at Washington University School of Medicine. He retired in 2005, and has remained a Professor Emeritus.

**Recruitment video reaches out to ID Fellow candidates**

The ID Division announces the completion of a recruitment video that provides candidates an inside look at the ID fellowship program at Washington University School of Medicine. The video can be viewed on our website or on our YouTube link.
Keith F. Woeltje, MD, PhD invited to participate in the AMIA task force

American Medical Informatics Association is the intersection between the work of stakeholders across the health and healthcare delivery system who seek to improve outcomes, lower costs, increase safety and promote the use of high-quality services.

The Clinical Informatics Subspecialty Practice Analysis Task Force (CIS PATF) will develop an updated description of the practice of clinical informatics expressed in terms of domains of practice, tasks performed, and knowledge required for practice informing. The final work product of the task force will serve as a blueprint for the American Board of Preventive Medicine (ABPM) Clinical Informatics Subspecialty examination.

Dr. Woeltje is a professor of medicine and vice-president and chief medical information officer for BJC HealthCare. The CIS PATF Members were selected to create a representative group of CIS Diplomates including professional roles, diversity, settings where they practice, and career stage. All individuals on the task force are CIS Diplomates representing different primary specialties of medicine.

Makedonka Mitreva, PhD elected to join the ASTMH Scientific Program Committee

American Society of Tropical Medicine and Hygiene (ASTMH) membership reflects a wide range of expertise in tropical medicine. For this reason, Society subgroups provide unique forums for members to engage in core scientific, educational, advocacy and policy issues related to a specific expertise with fellow stakeholders of similar interests.

Dr. Mitreva’s was appointed to the Intestinal and Tissue Helminths/Cestodes subcommittee for a three-year term, which began February 2018. Her contributions will help strengthen the Society’s scientific program.

Mattar joins faculty “Beyond Boundaries” interdisciplinary program

Caline Mattar, MD, instructor of medicine, joins faculty of “Beyond Boundaries” interdisciplinary program where archeologists teach alongside engineers, artists collaborate with doctors, and senior citizens and teenagers share in discussion groups. The Beyond Boundaries interdisciplinary program at Washington University in St. Louis offers first-year undergraduate students a wide array of experiences: exposure to new concepts and people and opportunities to learn from some of the world’s leading scholars across a spectrum of disciplines.

Education experts have praised the academic value of an interdisciplinary education, which breaks down barriers between disciplines for a more holistic experience. Caline Mattar, MD is teaching “Gender, Youth and Global Health” along with Jessica Levy, senior lecturer at the Brown School. The class explores the ways gender and gender differences affect different aspects of health, particularly for young people. The course is organized through and sponsored by the Institute for Public Health.
Burnham recognized by two medical societies

Carey-Ann D. Burnham, PhD, an associate professor of pathology and immunology at Washington University School of Medicine in St. Louis, has been named a fellow of the Infectious Diseases Society of America (IDSA) and the American Academy of Microbiology (AAM).

Burnham’s research focuses on antimicrobial resistance and developing novel diagnostic methods for detecting bacterial infections such as Staphylococcus aureus, Clostridium difficile and other multidrug-resistant bacteria.

Also an associate professor of molecular microbiology and of pediatrics, Burnham is one of 102 physicians and scientists who IDSA honored last year for significant contributions to the study of infectious diseases. She is one of 96 elected this year to AAM, which recognizes scientific achievement and original contributions that have advanced microbiology.

Burnham also is the medical director of Clinical Microbiology at Barnes-Jewish Hospital, as well as the program director for the university’s postdoctoral fellowship training program in medical and public health microbiology.

Keep up with the latest news on our website!
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Powderly leads panel discussion at International Forum in Taipei

Three key university leaders — Pratim Biswas, assistant vice chancellor and chair of the Department of Energy, Environmental & Chemical Engineering at the School of Engineering & Applied Science; William Powderly, MD, the Larry J. Shapiro Director of the Institute for Public Health; and Barbara Schaal, dean of the faculty of Arts & Sciences — served as keynote speakers, then led panel discussions comprised to further examine specific problems and identify possible solutions.

Washington University in St. Louis’ commitment to finding collaborative, creative solutions for far-reaching global problems is deep and wide-reaching. Of particular concern is the environment, and making the necessary choices to ensure the air we breathe, the water we drink and the food we eat is safe, clean and healthy.

A group of Washington University leaders — including Chancellor Mark S. Wrighton — traveled to New Delhi Dec. 15, then to Taipei Jan. 18, to present day long forums titled “How Energy Choices Affect Agriculture, the Environment, and Health.” The goal: engaging a variety of partners to advance solutions for the environmental challenges posed by energy choices.

“The forums — in both India and Greater China — enhanced the university’s leadership role in addressing one of the great challenges facing us: the effects of climate change on human health,” Wrighton said. “Both events allowed us the opportunity to meet directly with our global partners, corporate leaders and governmental officials as we all work toward solutions for this multifaceted and far-reaching issue.”

Three key university leaders — Pratim Biswas, assistant vice chancellor and chair of the Department of Energy, Environmental & Chemical Engineering at the School of Engineering & Applied Science; William Powderly, MD, the Larry J. Shapiro Director of the Institute for Public Health; and Barbara Schaal, dean of the faculty of Arts & Sciences — served as keynote speakers, then led panel discussions comprised to further examine specific problems and identify possible solutions.

“The major impact of energy choices on health will be determined by the degree to which those choices affect air quality and climate change-induced warming of the planet,” Powderly said. “Much of public health thinking centers on prevention.

“Earlier energy choices may have moved us beyond primary prevention of these public health problems. Instead, we need to focus on adaptation and mitigation of anticipated problems so that informed energy choices can minimize health consequences for communities across the world,” Powderly said.

Said Wrighton: "We see so many challenges ahead of us, and no single institution — and indeed no single country — can actually address all of the approaches to solving these big problems. So it’s important for us to partner with other institutions in other countries to solve global problems that face us all.”
Dr. Medoff honored with plaque representing the annual Gerald Medoff, MD Visiting Professors

Faculty and fellows gathered in April to present the “Annual Gerald Medoff MD Visiting Professor” plaque to Dr. Medoff. Dr. Medoff is honored for his leadership, outstanding vision, dedication and commitment to excellence during his tenure in the Infectious Disease Division at Washington University. The perpetual plaque hangs on the wall of the Infectious Diseases Division with the names of the visiting professors to date and name plates to add future professors who come to Washington University through an award in his name.

Courtney Chrisler, MD, assistant professor of medicine, Gerald Medoff, MD, emeritus professor of medicine, Hilary Babcock, MD, associate professor of medicine, and Gerome Escota, MD, assistant professor of medicine are among those present for the celebration.

Gerald Medoff MD Visiting Professors:
2014 Douglas D. Richman, MD
2015 Arturo Casadevall, MD, PhD
2016 Kieren A. Marr, MD
2017 Cynthia L. Sears, MD

Thank you to the many contributors who help make the annual “Gerald Medoff MD Visiting Professors” a reality!

INSPIRED 2018

Inspired 2018 commemorates the thousands of people who have found stable housing, renewed health and the inspiration to find hope through the programs of DOORWAYS, as well as those whose lives will be improved and empowered in the future. Members of the ID division attended this annual event on Feb. 3rd in support of the work of DOORWAYS.

Pictured l to r: Enbal Shacham, PhD, Traci Albers, MBA, Tawnya Brown, MSW, E.P. Barrette, MD, and Dr. Hilary Reno, MD.
Only after understanding the complex worm-microbiome interactions, can we determine if microbiome-mediated decrease of severity of worm infection is possible.

Makedonka Mitreva, PhD, led a study focused on interaction among the gut microbiome and gastrointestinal parasitic nematodes. The human intestine and its microbiota is the most common infection site for soil-transmitted helminths, which affect the well-being of ~1.5 billion people worldwide. Since the complex cross-kingdom interactions are not well understood we sought to identify and validate biologically meaningful associations between worm infections and the gut microbiota and its functional potential. We first compared the fecal microbiome of moderately/heavily infected individuals in Liberia to uninfected Liberian individuals, and identified specific microbial taxa being positively or negatively associated with infection. We then sought to validate our findings using subjects from a distinct geographical cohort (Indonesia). Our hypothesis was that if certain microbiome changes are driven by worm infection then regardless of the very different underlying diets, culture etc. in these two countries we should be able to identify conserved STH-associated and STH-discriminatory taxa. We identified one bacterial taxon (Lachnospiraceae) to be negatively associated with infection in both countries, and 12 bacterial taxa were significantly associated with STH infection in both countries. For example, Olsenella (associated with reduced gut inflammation) was positively associated with infection and was also significantly reduced in abundance following clearance of infection. Using samples from double-blind randomized trial we successfully delineated microbiome assemblage changes as a result of de-worming/self-clearing.

Using supervised machine-learning technique Mitreva lab and collaborators identified STH-infection discriminating taxa in the Liberia individuals, and tested its predictive value in the Indonesia individuals. The model has 75% classification power within the Liberia dataset and 73% predictive power for STH infections for the Indonesia dataset. In separate paper Dr. Mitreva and collaborators achieved performance improvement (up to 92% predictive value) when phylogenetic dependency for grouping microbial data was used (PMID:282239609).

Finally using different data type, metagenomic shotgun data, they identifying microbiome-encoded biological functions associated with STH-infected individuals, which included arachidonic acid metabolism; arachidonic acid is the precursor for pro-inflammatory leukotrienes that threaten helminth survival, and our findings suggest that some modulation of arachidonic acid activity in the STH-infected gut may occur through the increase of arachidonic acid metabolizing bacteria.

This is the first study to identify specific members of the gut microbiome that discriminate between moderately/heavily STH-infected and non-infected states across very diverse geographical regions using two different statistical methods and provides a novel insight of the cross-kingdom interactions in the human gut ecosystem, so that advances towards key mechanistic studies can be made.

print to practice

Memory loss from West Nile virus may be preventable

More than 10,000 people in the United States are living with memory loss and other persistent neurological problems that occur after West Nile virus infects the brain. Now, a new study in mice suggests that such ongoing neurological deficits may be due to unresolved inflammation that hinders the brain’s ability to repair damaged neurons and grow new ones. When the inflammation was reduced by treatment with an arthritis drug, the animals’ ability to learn and remember remained sharp after West Nile disease.

“These memory disturbances make it hard for people to hold down a job, to drive, to take care of all the duties of everyday life,” said senior author Robyn Klein, MD, PhD, a professor of medicine at Washington University School of Medicine in St. Louis. “We found that targeting the inflammation with the arthritis drug could prevent some of these problems with memory.”

The findings are available online in Nature Immunology.

Spread by the bite of a mosquito, West Nile virus can cause fever and sometimes life-threatening brain infections known as West Nile encephalitis. About half the people who survive the encephalitis are left with permanent neurological problems such as disabling fatigue, weakness, difficulty walking and memory loss. These problems not only persist but often worsen with time.

Klein and colleagues previously had shown that during West Nile encephalitis, the patient’s own immune system destroys parts of neurons, leading to memory problems.

“We started wondering why the damage isn’t repaired after the virus is cleared from the brain,” said Klein, vice provost and associate dean for graduate education for the Division of Biology & Biomedical Sciences. “We know that neurons are produced in the part of the brain involved in learning and memory, so why weren’t new neurons being made after West Nile infection?”

To find out, Klein; co-first authors Michael Vasek, a postdoc researcher, and graduate research assistant Charise Garber; and colleagues injected mice with West Nile virus or saltwater. During the acute infection, the mice received several doses of a chemical compound that tags neural cells as they are formed. Forty-five days after infection, the researchers isolated the tagged cells from the mice’s brains and assessed how many and what kinds of cells had been formed during the first week of infection.

Mice ill with West Nile disease produced fewer neurons and more astrocytes – a star-shaped neural cell – than uninfected mice.

continued
Astrocytes normally provide nutrition for neurons, but the ones formed during West Nile infection behaved like immune cells, churning out an inflammatory protein known as IL-1. IL-1 is an indispensable part of the body’s immune system. It is produced by immune cells that swarm into the brain to fight invading viruses. Once the battle is won, the immune cells depart and IL-1 levels in the brain fall. But in mice recovering from West Nile infection, astrocytes continue to produce IL-1 even after the virus is gone. Since IL-1 guides precursor cells down the path toward becoming astrocytes and away from developing into neurons, a vicious cycle emerges: Astrocytes produce IL-1, which leads to more astrocytes while also preventing new neurons from arising. Hampered by an inability to grow new neurons, the brain fails to repair the neurological damage sustained during infection, the researchers said.

“It’s almost like the brain gets caught in a loop that keeps IL-1 levels high and prevents it from repairing itself,” said Klein, who is also a professor of neuroscience and of pathology and immunology. To see whether the cycle could be broken, Klein and colleagues infected mice with either West Nile virus or saltwater as a mock infection. Ten days later, they treated both groups of mice with a placebo or with anakinra, an FDA-approved arthritis drug that interferes with IL-1.

After giving the mice a month to recover, they tested the animals’ ability to learn and remember by placing them inside a maze. Mice that had been infected with West Nile virus and treated with a placebo took longer to learn the maze than mock-infected mice. Mice that were infected and treated with the IL-1 blocker learned just as quickly as mock-infected mice, indicating that blocking IL-1 protected the mice from memory problems.

“When we treated the mice during the acute phase with a drug that blocks IL-1 signaling, we prevented the memory disturbance,” Klein said. “The cycle gets reversed back: They stop making astrocytes, they start making new neurons, and they repair the damaged connections between neurons.”

But, Klein cautions, IL-1 itself may not be a good drug target for people because of the important role it plays in fighting viruses. Suppressing IL-1 while the virus is still in the brain could exacerbate encephalitis, already a potentially lethal condition. “This is a proof of concept that a drug can prevent cognitive impairments caused by viral encephalitis,” Klein said. “This study sheds light on not just post-viral memory disturbances but other types of memory disorders as well. It may turn out that IL-1 is not a feasible target during viral infections, but these findings could lead to new therapeutic targets that are less problematic for clearing virus or to therapies for neurologic diseases of memory impairment that are not caused by viruses.”


This study was supported by the National Institutes of Health (NIH), grant numbers U19 AI083019, R01 NS052632 and HDTRA11510032; National Institute of Arthritis and Musculoskeletal and Skin Diseases, grant number P30AR048335; and the Speed Congenics Facility of the Rheumatic Diseases Core Center (experimental support).

by Tamara Bhandari-reprinted with permission. Source: Washington University Record
print to practice

ID’ing features of flu virus genome may help target surveillance for pandemic flu

This year’s influenza outbreak – the worst across the United States in nearly a decade – is worrisome but still far less dire than a pandemic flu, which could kill millions. Such pandemics are exceedingly difficult to predict, but new research at Washington University School of Medicine in St. Louis offers details about flu viruses that could help improve surveillance to detect a potential pandemic.

Pandemic flu occurs when flu strains from different species – birds and humans, or humans and pigs – genetically mix to make a new virus that spreads faster and makes people sicker than either strain alone. Public health authorities monitor places where people live in close contact with animals for the first signs of new pandemic viruses.

Reporting Jan. 31 in Nature Communications, the researchers identified features of the influenza virus genome that affect how well the virus multiplies. These features are similar but not identical across viral strains. It’s possible that the extent of similarity between strains influences whether two flu viruses can mix their genetic material to make a hybrid virus with the potential to explode into pandemic flu.

“We think that two strains need to have similar features in their genome to re-assort and make a new virus,” said senior author Jacco Boon, PhD, an assistant professor of medicine at Washington University. “We hope that in the future, this work will allow us to focus on certain strains of influenza virus and target our surveillance more narrowly so we have a better chance of identifying the next pandemic flu before it spreads.”

Flu viruses multiply by infecting cells and hijacking the cell’s machinery to mass-produce copies of the virus’s genome and proteins, which are then bundled into new viruses. Influenza virus’s genome is broken into eight parcels of RNA, a molecule similar to DNA. When a cell is infected with two or more flu strains at once, the genetic parcels from the different strains tend to get mixed up. The result is often a new influenza strain born with genetic information from multiple parental strains.

Boon and first author Graham Williams, PhD, now a postdoctoral researcher at Duke University, with the help of Sebla Kutluay, an assistant professor of molecular microbiology, found that parts of the virus’s RNA genome fold like origami into specific 3-D shapes and that these shapes are necessary for the virus to multiply. When they mutated the genome to change the shapes, the viruses did not reproduce well. “Silent” mutations that left the shapes intact, on the other hand, did not affect multiplication.

There are thousands of different flu viruses in the world, each differing slightly in their genetic sequence and, most likely, the shapes into which their RNA folds. Flu viruses whose genomes form very different 3-D structures may not be able to recombine into a new strain. “Right now we do surveillance on pretty much everything,” said Boon, who is also an assistant professor of molecular microbiology, and of pathology and immunology. “But if we know that the viruses from a certain species or a certain region just don’t have the right RNA features, then we can make surveilling them a lower priority. If we can focus our resources more effectively, we may be able to catch the next pandemic flu before it really gets going.”

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

First author, Graham Williams, BA, MSc, PhD, is the first recipient to receive the Victoria Fraser Infectious Diseases Research Fellowship. Graham was a graduate student in the Boon Lab where he completed a PhD in Molecular Microbiology and Microbial Pathogenesis in October 2017 and is now a postdoctoral associate at Duke University.

This study was supported by the National Institutes of Health (NIH), grant numbers P01-AI120943 and R01-AI118938; National Institute of General Medical Sciences, grant number ST32GM007067; the National Institute of Allergy and Infectious Diseases, grant number 2T32AI007172; and the Victoria Fraser Infectious Disease Research Fellowship.
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

William Powderly, MD

Ms. Melissa Werkmeister

Your Donations Are Greatly Appreciated!

To make a gift to the Infectious Diseases Division, you may contact Traci Albers, Division Administrator, Infectious Diseases Division, or mail your contribution. Checks can be made payable to:

Washington University School of Medicine
Infectious Diseases Division
ATTN: Traci Albers, MBA
Campus Box 8051, 4523 Clayton Ave.
St. Louis, MO 63110

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