Winter 2019/2020

MicroScoop

The Newsletter of the UMB Microbiology & Immunology Community

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MICROSCOOP STAFF

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Angel Corona ('19), Contributing Editor
Emily Smith, Contributing Editor
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Rainer Butler, Contributing Editor
David Rach, Contributing Editor

With special thanks to Heather Ezelle, PhD

Congratulations to MMI Faculty!

Congratulations to **James B. Kaper, Ph.D.**, Professor and Chair of the Department of Microbiology and Immunology and Vice Dean for Academic Affairs for his investiture in 2019 as the James and Carolyn Frenkil Distinguished Dean's Professor. He is among an elite group of only 82 endowed professorships established at the University of Maryland School of Medicine.

Dr. Kaper has also been awarded the 2019 American Society of Microbiology (ASM) D.C. White Award for his accomplishments in interdisciplinary research and mentoring in microbiology.

Laurels are also in order for **Gregory Carey, Ph.D.**, Associate Professor of Microbiology and Immunology and Director of Student Research and Community Outreach, who was presented the Dean's Faculty Award for Diversity and Inclusion. In addition to Dr. Carey's outreach activities in the local West Baltimore community, he is also the new Director of STAR-PREP, Science Training for Advancing Biomedical Research Post-Baccalaureate Research and Education Program, where he mentors and matriculates recent baccalaureate graduates with strong desires to pursue advanced science degrees.

New Students (1st Year)

Athena Ellis

Hometown: Laurel, MD
Before Graduate School: I attended UMBC for undergrad and graduated in 2014 with a BS in Biology. I then worked at Walter Reed Army Institute of Research (WRAIR) in the Division of Experimental Therapeutics in a malaria lab testing novel antiparasitics in the Department of Drug Discovery. I then worked in the Department of Entomology with mosquitos and sand flies for usage in malaria clinical trials and leishmania drug development. I just graduated, in May, from Johns Hopkins Bloomberg School of Public Health with my masters in Microbiology and Immunology. I'm excited to embark on this next step in my journey with all of you at UMB!
Scientific Interests: My passion is parasitology, specifically drug development of antimalarials; to contribute to the ongoing efforts to stay ahead of the recurring threat of resistance to our current therapeutics.
Hobbies/What I do in my free time: Most all of my free time is spent with my amazing, 12 year old son who is absolutely my favorite person on the planet. For adult fun, salsa dancing is a my stress outlet!

James (Jimmy) Logue

Hometown: I was born in southern Michigan; grew up in Bel Air, Maryland
Before Graduate School: I worked for Johns Hopkins University performing high-throughput sequencing, then I worked in a BSL-4 lab at the NIAID Integrated Research Facility helping to manage and run large animal studies on high-consequence pathogens.
Scientific Interests: I'm interested in immune deficiencies during infectious diseases (pathogen immune evasion, overactive immune responses, etc.)
Hobbies/What I do in my free time: Marathon training; playing music; a lot of movie watching

Marisa McGrath

Hometown: Georgetown, MA
Before Graduate School: I attended Wake Forest University where I received a B.S. in Medicinal Chemistry and Drug Discovery; and French Studies.
Scientific Interests: I'm interested in vaccine development for viruses, particularly Influenza and HIV. I'm also interested in viruses as vectors for gene therapy.
Hobbies/What I do in my free time: I enjoy rock climbing, hiking, and watching horror movies.
Fun fact: I worked at a Stoneyard during the summers in college so I can walk you through building your dream patio if you're interested.

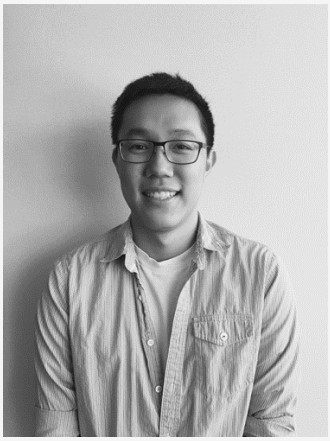
Riley Risteen

Hometown: Glastonbury, CT
Before Graduate School: I earned my Master's from George Mason University
Scientific Interests: bacterial pathogenesis
Hobbies: video games, fencing, hiking
Fun Fact: I worked at a wildlife refuge where I trained an alligator named Garth

New Students (1st Year)

Corbin Goerlich, M.D. (Ph.D. for Clinicians Student)

Hometown: Houston, TX
Before Graduate School: I worked at Johns Hopkins Hospital as a General Surgery Resident
Scientific Interests: Transplant Immunology, Tolerance and Xenotransplantation
Hobbies/What I do in my free time: Trying to get into (and get decent at) golf
Fun fact: I am a quadruplet



Franklin Ning (M.D./Ph.D. Student)

Hometown: Germantown, MD
Before Graduate School: I was in medical school at UMB
Scientific Interests: Metastases, drug resistance, 3D culture systems, immunotherapy
Hobbies/What I do in my free time: I enjoy going to the gym and cooking! Also, in any extra spare time I have, I read and play video games.
Fun fact: I worked at a sushi restaurant in college.

Kieran Tebben (M.D./Ph.D. Student)

Hometown: New Hope, PA
Before Graduate School: I attended Ohio State University and majored in microbiology and public health. I did research on the autophagy pathway in the malaria parasite, Plasmodium falciparum.
Scientific Interests: infectious disease genomics, parasitology
Hobbies/What I do in my free time: I love to bike ride, hike, or take my dog on extra long walks. I hate baking, but I love to cook. During breaks, I love to travel and see new places.
Fun fact: I took piano lessons for 10 years.

Alexandra Vlk (M.D./Ph.D. Student)

Hometown: Cockeysville, MD
Before graduate school: I attended Towson University (and then completed 2 years of medical school at UMSOM)
Scientific interests: I am interested in learning more about the human immune response to infectious diseases.
Hobbies/free time activities: running, being outdoors (hiking, kayaking), crafting (knitting, card making, jewelry making), Latin dancing
Fun fact: I enjoy riding my unicycle and I've been riding since I was in 6th grade!

New Students (2nd Year)

Rainer Butler

Hometown: Glen Alpine, NC
Before Graduate School: I attended UNC Chapel Hill for undergraduate and received degrees in biology and classical history. Additionally, I worked with *Clostridium difficile* and discovered I really enjoyed research.
Scientific Interests: I'm interested in pathogenic bacteria. More specifically, what mechanisms they use to cause illness, and their host's immune response.
Hobbies/What I do in my free time: A couple of my favorite hobbies include video games, reading, and drawing, BUT when I get the time I love being outdoors (hiking, camping) and traveling. I will eat anything and love new experiences.
Fun fact: To date, I've visited 14 countries across Europe and Asia

Liron Marnin

Hometown: I was born, raised, and spent my early childhood in Israel, with many summers spent in Bolivia. However, I finished high school in Pennsylvania. I consider the whole world my hometown :)

Before Graduate School: I obtained my BS in Biology/CLS from Neumann University. Upon graduating, I spent one year working as a Med Tech/CLS in a hospital setting. I then obtained my MS in Molecular Medicine from Drexel University and worked one year in academia (UPenn). I was fortunate to carry out an exciting proof of concept project which focused on using synthetic nucleic acid antibody as a novel cancer immunotherapy. My career then took a leap when I decided to join an industry setting. I joined a CRO company (Reaction Biology Corp.) where I wore many hats carrying out biochemical experiments, contributing to sales and marketing, and finally managing a team of scientists.
Scientific Interests: I have yet to establish a specific and detailed scientific interest. However, I am broadly interested in innate immunity, adaptive immunity, autoimmune disorders, and immunotherapy development. I find the immune system of humans and other animals to be quite fascinating and am intrigued by the everyday scientific breakthroughs related to this field. I also have a personal vendetta (for lack of better words) against autoimmune disorders and always seek further understanding to their complexities.
Hobbies/free time: Traveling, gym/exercise, salsa dancing, sketching/painting, petting every possible dog, and spending time with my little brother

New Students (2nd Year)

David Rach

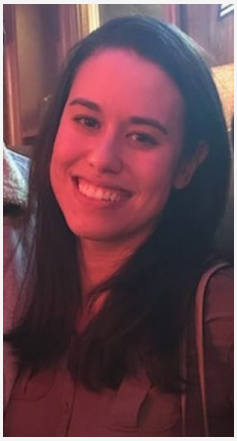
Hometown:
Born in Michigan; my parents worked in international development, so I grew up in Comitán, Chiapas, México. I moved myself back to the US for college 15 years later.

Before Graduate School:
I attended the University of Wyoming, graduating with my B.S. Molecular Biology and Microbiology. During my time there, I researched how Natural Killer (NK) cells in mice respond to secondary infection by different *Toxoplasma gondii* strains. After graduating in 2016, I have worked as a Peace Corps Volunteer in Ghana, West Africa, teaching biology and chemistry at a rural high school. In addition to teaching, I worked on malaria awareness and prevention secondary projects.

Scientific Interests:
I am fascinated by host-pathogen interactions, how they arise, interact and influence each other. I am interested in the mechanisms governing immune evasion; generation and maintenance of immunological memory; as well as how genetic variation at the population level and over evolutionary time contribute.

Hobbies/What I do in my free time:
All things Coffee, Stout Beer, Backpacking, Hiking, Birding, Reading, Travel, World News, and Language learning.

Fun fact: When I started college, I was aiming to become a wildlife biologist (worked a field season watching eagle nests in Belize). But I then had the "terrible misfortune" of absolutely loving my Organic Chemistry class, then my General Microbiology class, then fast forward six years later and I am here as a 2nd year MMI student.



Alexandra Soare

Hometown: Winston-Salem, NC and Fort Lauderdale, FL

Before Graduate School: I got my MS in Microbiology & Immunology at Tulane University in 2014. I did a thesis literature review on evolution of different *Mycobacterium tuberculosis* lineages and its impact on pathogenesis. Additionally, I worked on projects related to the use of *dmLT* as a mucosal adjuvant for vaccine development in the laboratory of Dr. John Clements. After I graduated, I moved to NYC and joined the laboratory of Dr. Jonathan Lai at Albert Einstein College of Medicine, working on engineering antibodies to be used as viral immunotherapeutics. In 2016, I joined the laboratory of Dr. Benjamin Chen at the Icahn School of Medicine at Mount Sinai where I worked with Dr. Talia Swartz on studying the mechanism of HIV associated inflammation through purinergic receptors.

Scientific Interests: Vaccine development, mechanisms of pathogenesis, science that can be translated for global health policy

Hobbies/What I do in my free time: I grew up in the South so I love go hiking and explore the outdoors. But when it's too hot or cold for that, I play the keyboard, try to play with other people's pets, cook, and use other people's HBO account to watch some shows. I also watch a lot of basketball (gotta represent NC and FL so I cheer for the Miami Heat and UNC Tar Heels).

New Students (2nd Year)

Gideon Wolf (M.D./Ph.D. Student)

Hometown: Baltimore, MD
Before Graduate School, I completed my first 2 years of Medical School at the University of Maryland. Before that, I worked at the NIH for two years after graduating from university.
Scientific interests: I am interested in the cross sections between infectious disease, immunology, and potentially oncology.
Hobbies: In my free time *has not existed for 2 years*, I play tennis and love learning new recipes for cooking.
Fun fact: I was recently hiking in Lake Louise in Alberta, and if you hike up to Lake Agnes, which is just a little bit higher elevation from Lake Louise, you can find Canada's oldest Tea House! They serve homemade tea and all sorts of delicious snacks to hikers passing by.

Adrienne Kambouris (M.D./Ph.D. Student)

Hometown: Baltimore, MD
Before Graduate School: I joined the Army when I was 17, as soon as I graduated from high school. I served for 10 years as a military intelligence sergeant and deployed to Iraq twice. I separated in 2013 and pursued my BS full time at Augusta University. In 2016, I graduated with a degree in Cell and Molecular Biology and Chemistry.
Scientific Interests: I'm interested in microbial pathogenesis, specifically virulence factors causing cholesterol acquisition in *C. psittaci* and *C. trachomatis* infections.
Hobbies/What I do in my free time: I'm married with three children that we homeschool. I like playing video games with the kids. In the rare moment that I have time to myself, I enjoy reading.

Michael Sikorski (M.D./Ph.D. Student)

Hometown: Ellicott City, MD
Before Graduate School: I spent one year in Madrid, Spain applying my undergraduate work in polymeric biomaterials to a skin tissue engineering project
Scientific Interests: Microbiology, Global Health, Epidemiology, Public Health, and Biotechnology
Hobbies/What I do in my free time: I play bluegrass fiddle and I like hosting house concerts. I also love exploring the outdoors.
Fun fact: Here at our medical school I help run the student-led medical arts and humanities journals - *The Healer's Art* and *The White Coat Reflections*.

12th Annual Grollman Visiting Professorship and MMI Program Host Dr. Eva Harris

By Anya O'Neal

The 2019 12th annual Dr. Aaron I. Grollman Visiting Professorship in Basic Sciences Lectureship was a special event for the UMSOM Microbiology and Immunology community. The two-day Grollman Lectureship is an annual event established by the Graduate Program in Life Sciences (GPILS) and the Dr. Aaron I. Grollman Visiting Professorship that brings internationally renowned scientists to discuss impactful health and science issues with members of UMSOM. This year, the MMI graduate program hosted Dr. Eva Harris, Professor of Infectious Diseases and Vaccinology and Director of the Center for Global Health at University of California, Berkley. Dr. Harris is a leading expert on control of mosquito-borne viruses, including dengue, chikungunya, and Zika viruses. Additionally, she has been hailed for her service efforts in Latin America, such as developing research tools and diagnostic methods for neglected populations impacted by tropical infectious diseases.

During the first day of the two-day event, Dr. Harris gave a seminar on her volunteer work in Central and South America, such as helping local populations implement mosquito control practices in their communities. Later in the evening, faculty and students from the Department of Microbiology & Immunology chatted and ate dinner with Dr. Harris at the Argentinian steakhouse Bar Vasquez. The following day, students from the MMI and Epidemiology graduate programs had lunch with Dr. Harris at Frank & Nic's, where she spoke with students about her love of traveling and salsa dancing. The day concluded with a second seminar on her basic science research, titled "Friend or Foe? Immune responses to dengue and Zika viruses."

In Memory of Mark E. Shirtliff, Ph.D.

By Emily Smith

"It is not the length of life but the depth of life," (Ralph Waldo Emerson). This quote holds true to the life of Mark E. Shirtliff, Ph.D. As a scientist, inventor, entrepreneur, mentor, professor, father, husband, and adventurer, Mark was profoundly full of life. Sadly, Mark lost his life in a tragic river accident on the Yellowstone River near Gardiner, Montana on July 12th, 2018. The University of Maryland Baltimore (UMB) community continues to feel an immense loss in the absence of Mark Shirtliff. He touched so many lives in our community ranging from faculty, to numerous students, to administrative staff, to housekeeping staff, and to many others.

He made a particularly large impact on the UMB community as a scientist, mentor, and professor at UMB. Mark held a primary appointment as a professor in the Department of Microbial Pathogenesis in the University of Maryland School of Dentistry (UMSOD) and a secondary appointment as a professor in the Department of Microbiology and Immunology in the University of Maryland School of Medicine (UMSOM). Mark's lab studied the bacterial pathogen *Staphylococcus aureus*, in particular methicillin-resistant *S. aureus* (MRSA), and his most recent work aimed to fight against dangerous MRSA infections that form microbial communities called biofilms. His passion for his research drew many students into his lab as he mentored countless students pursuing a variety of degree backgrounds including PhD, MD, MD/PhD, DDS, and DDS/PhD as well as other interning students. In addition to his role as a scientist and mentor in the lab, he mentored students outside of the lab during his course lectures and during his service as the chair of the Molecular Microbiology and Immunology (MMI) qualifying exam committee.

He deeply cared about the students and valued them as fellow colleagues and as developing scientists. He generously gave of his time to help students work through challenging concepts or experiments and provided unwavering encouragement and support to students when faced with academic as well as personal challenges. Many students have shared that Mark's mentorship in addition to his passion for science permanently impacted their time at UMB and shaped their lives during their careers.

Devon Allison, PhD, a DDS/PhD student in Mark's lab who defended her thesis and received her PhD, shared an example of Mark's impact in her life. With her dual degree, Devon frequently has to juggle her science in the lab with responsibilities in the dental school clinic. "I had gone into Mark's office after getting done with clinic. I remember I was pretty tired, because I was in oral surgery. He and a fellow labmate were just talking and drinking some bourbon, and I came in and sat down. Mark asked me if I was okay, to which I gave my typical 'yeah.' He then said, 'So no, you're not.' He asked me what was wrong, and I mentioned that I didn't feel like I had even deserved to get my PhD, like I hadn't done enough work. And then he said 'You are having imposter syndrome. You feel like you're just a sham. I have this too.' I was rather shocked that Mark mentioned that, but he kept reassuring me that most likely, if I didn't have some thought over it, I was probably doing something wrong. He added that I needed to not get consistently bogged down with the negative thoughts. Anytime I ever started doubting myself, Mark was there to reassure me. There was always someone on my side with Mark, and that's something that I know many people go through school never experiencing."

His scientific interest in MRSA aligned with his personally affirmed duty to be a public servant and help others as his lab pursued a vaccine against MRSA antigens. His research aimed to specifically target those antigens expressed during biofilm growth, leading to the development of a vaccine against MRSA. Mark was the lead inventor of this unique multivalent vaccine designed to fight against MRSA infection in both biofilm and free-floating phases of the bacterial lifestyle. The vaccine was licensed to Serenta Biotechnology, LLC, a Gaithersburg, Maryland-based startup that he, in fact, was a co-founder and chief scientific officer of. In a way, Mark's legacy will continue to live on in the vaccine.

Mark was definitely an adventurer. He annually visited Montana with his family to embrace the outdoors through many outdoor recreational activities, such as hiking, boating, and fishing. He was a husband to his wife, Birthe Kjellerup, PhD, MSc, assistant professor in the Department of Civil and Environmental Engineering at the University of Maryland, College Park. He was also a father of four.

The UMB community held a memorial service for Mark Shirtliff on July 25th 2018 to honor his life and legacy by bringing together those who cared about him and sharing personal stories about Mark. The service manifested the true impact that Mark had on the UMB community. The Graduate Program in Life Sciences created an annual award called the *Mark E. Shirtliff* PhD Mentor Award to honor Mark's legacy as an engaging and impactful mentor to his graduate students. Mark's death leaves a hole in the UMB community that will never be filled. He is greatly missed by all.

In Memory of Mark E. Shirtliff, Ph.D.

By Jeff Freiberg, M.D. ('17), Ph.D. ('15)

When asked to share about Mark Shirtliff, it would be very easy to start with a humorous story, as there are many of those. However, in reflecting on how I wanted to begin, I thought that I should start with what stood out the very first time I met Mark. As a prospective graduate student visiting Maryland on my interview trip, I was impressed right away by Mark's passion and enthusiasm for his science. It was completely contagious, and you couldn't listen to him talk about what his lab was doing without getting drawn into the excitement. It was that enthusiasm that made me want to join his lab and study biofilms, despite coming into graduate school without any interest in the topic.

The scale of Mark's passion for biofilms was truly global- he was deeply involved in the microbiology community across three different continents, even helping to bring a biofilm conference to China. His ability to clearly and convincingly convey the significance of biofilm infections and the threat they posed to anyone and everyone was remarkable. His career-long commitment towards finding a vaccine against chronic *Staphylococcus aureus* infections was equally impressive. Although he made numerous substantial contributions to the field, it is a great shame that he will not have the opportunity to see the culmination of his vaccine project. He would frequently speak about his work in terms of the raw numbers of people that could be helped and the lives that could be saved by the vaccine. It was the embodiment of one of the best pieces of advice I received from Mark: if you want other people to be excited and care about the work you are doing, you need to be passionate and believe in what you are doing first.

It wasn't just biofilms or Staph that Mark was excited about. He was very passionate about science in general. He devoted a substantial amount of time to teaching. In addition to running the microbial pathogenesis course and qualifying exams in the Molecular Microbiology and Immunology graduate program, he also lectured in both the dental school and medical school at UMB and taught an online biofilms course.

Mark was never one to take for granted the unique opportunity that a career in academics provides. On multiple occasions, he expressed the deep gratitude he had for where he was in life and the ability to have a career doing what he was doing. This was also reflected in his strong desire to support and encourage young scientists at all stages of training. In his lab, you would frequently find all types of people ranging from high school students doing summer rotations in a lab for the first time to physicians and dentists who had never held a pipet before. Mark took all of them in and imparted some of his wisdom and a whole lot of his enthusiasm for science. I often felt that he viewed mentoring as his most important job, frequently working to help advance other people's careers over his own interests.

But of course, his greatest passion for mentoring lay with his graduate students, among whom I feel incredibly lucky to be counted. Mark epitomized what it meant to be a mentor. He was very deliberate in taking on graduate students, as he wanted to make sure he could provide each of his students with enough attention. He looked at mentoring as a very big commitment and one that was a lifelong responsibility. He went above and beyond, treating his graduate students as he would a family member.

Finally, I'll end where many stories about Mark begin, with the fact that he was one of the funniest people I have ever known. There was no one better to get a drink with, whether it was one-on-one or with a dozen people down at Pickles Pub. It truly is hard to put into words Mark's personality. It was something that you had to experience to believe. You never knew what Mark was going to say or do next. He once admitted to his strategy as "making other people feel comfortable by making the biggest fool of himself first." And it worked. He would seamlessly integrate all-out-silliness with serious scientific conversations, with more than a few collaborations being born that way. He was truly one of a kind and an unbelievable loss for his mentees, UMB, the biofilm community, and the world in general.

In honor of Mark's memory and research,

Mark Shirtliff BioFilm Day

Thursday, February 27, 2020

9 am—5 pm, HSFIII Auditorium

Please contact Cecilia Lizer (clizer@som.umaryland.edu) for more information

In Memory of Mark E. Shirtliff, Ph.D.

An example of the collegiality and humor Mark brought to his work and relationships. A past lab curling trip with both graduated students and more recent lab members. From left to right: Migena (Nate's wife), Nate Archer (MMI alumnus), Birthe (Mark's wife), Mark, Frank (Jan's husband), Jan (research associate in the Shirtliff Lab), and Kriste Brao.

Congratulations MMI Graduates!

Andrew Clerman, M.D., Ph.D., June 2018; "Intracellular stability of precursor IL-33 is maintained through interaction with importin-5"; Advisor: Sergei Atamas, M.D., Ph.D.

Molly K. Hritzo, Ph.D., June 2018; "Differential FOXO1 Localization in SLE and Healthy Human Lymphocyte Subsets"; Advisor: Amit Golding, M.D., Ph.D.

Lalena Wallace, Ph.D., June 2018; "Identification and Characterization of Factors Associated with Biofilm Formation in *Acinetobacter buamannii* Surveillance Isolates"; Advisor: David Rasko, Ph.D.

Mark L. Guillotte, Ph.D., July 2018; "Structure and synthesis of Lipid A of Rickettsia species"; Advisor: Abdu F. Azad, Ph.D., M.P.H.

Mark Rudolph, Ph.D., October 2018; "Pediatric cell-mediated immune system response to Ty21a typhoid vaccination compared to adults"; Advisor: Marcelo Sztein, M.D.

Erin McClure Carroll, Ph.D., February 2019; "XIAP-p47 Pairing Activates the Immune Deficiency Pathway in the Lyme Disease Tick *Ixodes scapularis*"; Advisor: Joao Pedra, Ph.D.

Matthew Chung, Ph.D., April 2019; "Drug Repurposing For Lymphatic Filariasis Enabled with Multi-Species Genomics Approaches"; Advisor: Julie Dunning-Hotopp, Ph.D.

Mary Masterson, Ph.D., April 2019; "Role of Vaccine Induced IgG in Protection Against *Bordetella pertussis*"; Advisor: Marcela F. Pasetti, Ph.D.

Sarah J. Doran, Ph.D., May 2019; "Traumatic Brain Injury (TBI) Causes Alterations in Myeloid Cell Function: Role of Sex Differences and Lung Infection on Overall Outcomes following TBI"; Advisor: David Loane, Ph.D.

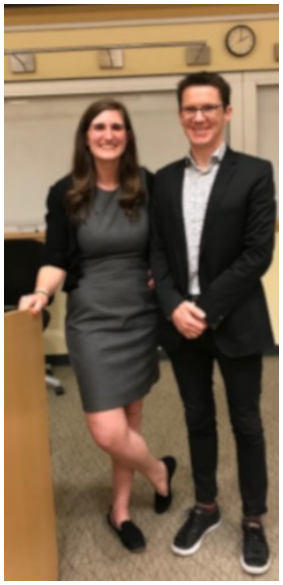
Erik Klontz, Ph.D., May 2019; "Molecular Mechanisms of Enzymes in Infection and Immunity"; Advisor: Eric J. Sundberg, Ph.D.

Steven Dudics, Ph.D., July 2019; "Micro-RNAs as biomarkers and therapeutic targets for arthritis"; Advisor: Kamal Moudgil, M.D., Ph.D.

Susannah C. Shissler, Ph.D., October 2019; "Natural Killer T Cell Development and Activation: Implications in Cancer Immunotherapy"; Advisor: Tonya J. Webb, Ph.D.

Abigail Corona, Ph.D., November 2019; "The Roles of Autophagic SNARE Proteins SNAP29 and SNAP47 in Autophagy and Enterovirus D68 Replication; Advisor: William T. Jackson, Ph.D.

Angel F. Corona Velazquez, Ph.D., November 2019; "Viral and Cellular Determinants of Picornavirus-mediated Autophagy Induction"; Advisor: William T. Jackson, Ph.D.



Sarah Doran, Ph.D. with her thesis advisor, David Loane, Ph.D.

Meet the New MMI Faculty Members

Som Chatterjee, Ph.D. (by L. Rainer Butler)

Dr. Chatterjee was born and raised in Kolkata, India. He received his master's degree from the Department of Biophysics and Molecular Biology, University of Kolkata, India. Then he completed his PhD in the lab of Dr. Trinad Chakraborty in Justus-Leibig University, Germany where he studied the infection process of *Listeria monocytogenes*. His next step took him to Dr. Michael Otto's group at the NIH where he studied the secretion of a group of cytolytic peptide toxins in *Staphylococcus aureus*, a human bacterial pathogen that is responsible for high morbidity and mortality worldwide. In 2014, Dr. Chatterjee joined Dr. Henry Chambers' lab at the University of California, San Francisco where he became interested in the public health issue of antimicrobial resistance in *S. aureus*.

In 2015, he reached Assistant Adjunct professor at UCSF and remained there until he joined the faculty of University of Maryland, Baltimore in January of 2019. He is currently located in IMET and came to UMB due to the affordability of living, familiarity, and scientific vibrancy of the area. His lab is currently focused on understanding the fundamentals of *S. aureus* pathogenesis. In the last 4-5 years, their lab has identified several novel pathways that are involved in beta-lactam resistance in *S. aureus*, and they hope to elucidate aspects of basic biology that are crucial for bacterial resistance. Outside of the lab, Dr. Chatterjee enjoys cooking and advises graduate students to work hard, network, and be curious. Additionally, he is recruiting graduate students.

Muhammad M. Mohiuddin, MBBS (by David Rach and Jackline Lasola)

Dr. Mohiuddin's research group is trying to overcome the shortage of human organ donors by investigating the use of non-human (pig) organs, or xenografts, for transplantation in humans. In order to make these organs usable, his lab is genetically modifying the pigs to remove possible antigens that are recognized by humans and also inserting human transgenes to make the organs from these pigs more compatible with humans.

His advice to graduate students is to find your own research niche and choose something that will make a major impact on improving human health and curing disease. There is nothing wrong with picking an area of research that is popular with funding potential, but you would be better served by finding your own path!

Remembering the father of molecular microbial pathogenesis: Dr. Stanley Falkow

By Angel Corona, Ph.D. ('19)

When we hear the word pathogen, we immediately fixate on the effect of that pathogen on the host, where more often than not, that host is us. Immeasurable time, effort, and research funds have gone into discovering the mechanisms as to how pathogens cause disease. In the CDC's 1998 edition of *Emerging Infectious Diseases*, Dr. Stanley Falkow, a professor in the Department of Medical Microbiology at Stanford University, wrote an article entitled "Who Speaks for the Microbes?" In it, he highlighted several overlooked facts by microbiologists. First, if we are to blame microbes for causing diseases, then we must blame ourselves for causing the microbes to become pathogens. Essentially, our globalization and changes in our own environment have created opportunities for microbes to become pathogenic. Becoming pathogenic is only in the interest of the microbe, as it opens a new niche (humans) that has very little competition. Dr. Falkow wrote: "I believe that many of what we refer to as emerging diseases are characterized better as 'diseases of human progress.'" This thinking, of thinking 'like a microbe' is ultimately what led Dr. Falkow to understand the nature of pathogenesis and antibiotic resistance and led to the work that ultimately defined an entire field of molecular microbial pathogenesis.

Microbiologists around the world are familiar with Dr. Falkow's seminal work. Yet, to budding microbiologists like myself, we may take for granted the scientific accomplishments of Dr. Stanley Falkow. The identification and characterization of "virulence factors," is in most part indebted to the work of Dr. Stanley Falkow. Microbiologists are familiar with the famous Koch's postulates and indeed this definition is still in use despite having been developed in the 19th century. Dr. Falkow extended these definitions on a molecular basis in 1988, now known as the Molecular Koch's Postulates, which strictly defined the relationship between specific genes and virulence. His revolutionary idea showed that pathogenesis, including antibiotic resistance, wasn't permanently 'stuck' within a single sub-population, but could be shared throughout the entire population, given the right selective pressure. In fact, the recognition that antibiotic resistance could be passed on caused Dr. Falkow to raise the alarm on the threat of multidrug resistance decades before society truly appreciated the danger.

As microbiologists, we take for granted the now common knowledge that bacteria can carry plasmids, that these plasmids can encode genes that contribute to virulence, and that these plasmids can be shared with other bacteria. All of this can be attributed back to Dr. Falkow's work. One of the plasmids he described, RSF1010, was used for the very first recombinant DNA experiment. The impact that the use of plasmids has had on the field is impossible to assess. It is therefore no surprise that Dr. Stanley Falkow received numerous awards throughout his lifetime. The American Society for Microbiology recognized Dr. Falkow's scientific contribution to the field in 2003 when he was awarded the Abbott Lifetime Achievement Award. That same year, the National Academy of Sciences also awarded him with the Selman A. Waksman Award in Microbiology. In 2008, he has one of 5 scientists that year to receive the highly prestigious Lasker award for medical research. And in 2016, he was awarded the National Medal of Science by President Obama. There's little doubt that Dr. Falkow's scientific contribution may have ultimately led to a Nobel Prize, an honor that he did not want. After his retirement from leading the Department of Medical Microbiology at Stanford University, he was asked by the institution on his thoughts about being nominated for the Nobel Prize. He remarked that he did not want that because he did not want to be dragged around like a celebrity, being forced to make appearances for appearance sake. The last line of his May 10, 2018 obituary in the New York Times quoted him as saying "At least I didn't win a Nobel Prize". This down-to-earth personality for someone so accomplished was something unique to Dr. Falkow.

Perhaps Dr. Falkow's greatest contribution wasn't his role as a scientist, but as a mentor. Throughout his career, Dr. Falkow mentored hundreds of trainees, many of which have become heads of their own microbiology departments, or distinguished members of the National Academy of Sciences. Our own UMB is fortunate enough to have two members that were trained by Dr. Falkow: Dr. Patrik Bavoil (SOD) and Dr. James Kaper (SOM). Dr. Falkow believed strongly that a scientist's legacy wasn't just the work they left behind, but the students and trainees that they helped mentor. It is easy to be impressed reading all of Dr. Falkow's scientific accomplishments, but to really understand who he was as a person, mentor, and friend, one has to talk to the people he impacted.

I spoke with Dr. Patrik Bavoil, who fondly remembered his time working in Dr. Falkow's lab as a post-doc. According to Dr. Bavoil, Dr. Falkow was a very free-spirited and down-to-earth person, who allowed his lab members to express their creativity, not just in their work, but in their lives. He had a larger-than-life personality, the type of person who was noticed the moment he walked into a room. Dr. Falkow was described as a modest person, but dedicated, to his trainees. "He was a strong believer that to be a mentor, one must first learn from the student." Dr. Bavoil commented on Dr. Falkow's mentoring style: "This type of mentorship was not only positive for the student, but for the mentor as well." Dr. Bavoil strongly believes that Dr. Falkow's style and ideals of mentorship were passed down to his trainees, including himself.
Behind the academic mask, however, Dr. Falkow had a remarkable sense of humor. I was fortunate enough to hear about some of these stories from Dr. Bavoil himself, and it was very easy to see Dr. Falkow was a remarkable person. Dr. Falkow liked to joke and playfully tease his lab members, but with no ill-will ever intended. Dr. Bavoil shared a particularly humorous story about Dr. Falkow. "[Dr. Falkow] always threw an annual Christmas party at his home for the entire lab, where we all brought food to share. I remember one time after being teased about her cooking, that Carleen Collins, a postdoc at that time, planned a lab wide prank on Stan. [Dr. Falkow] had joked that she could probably only cook Jell-O successfully. To get back at Stan, she asked us to bring two things: the first was a Jell-O dish which we were to bring inside. The second was the actual dish that we were to keep hidden in our cars. I was the first to arrive and so I came in with my Jell-O dish and Stan's wife, Lucy, remarked on how thoughtful that was. Soon enough, more people started arriving, all with their own Jell-O dishes. By the third dish, Lucy's face had turned grey but Stan had quickly caught on as to what was going on. The entire table was soon filled with so many Jell-O dishes. Once the prank ran its course, we brought in the real dishes."

It is not surprising that Dr. Falkow impacted so many people throughout his career. He was always willing to talk with students and was delighted to be invited by graduate students as a student invited speaker. He kept in contact with his students, even sharing memories and inside jokes from when they were still in his lab. Dr. Falkow was a good role model, not just because of his scientific contributions, but his ability to stay humble and modest. "I have two scientific heroes." Dr. Bavoil told me. "The first is my thesis mentor and the second is Stan." Dr. Bavoil later commented. "[Dr. Falkow's] impact transcends just his science."

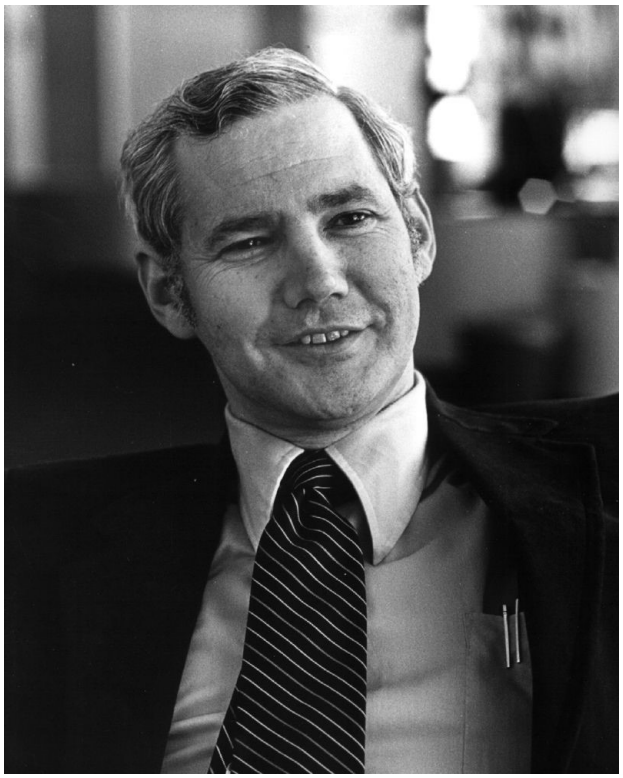
I also talked with Dr. Kaper about his time as a postdoc with Dr. Falkow, which as I learned, never truly ended once you left his lab. "He was a lifelong mentor." Dr. Kaper explained. When asked about Dr. Falkow's mentoring style, Dr. Kaper explained that his mentoring style could be summarized by the phrase "teaching yourself." This is explained in a letter exchange where the topic of mentoring comes up, Dr. Falkow wrote:

> *"...all I did was give you the opportunity to train yourself. I emulated my mentors and people like Doc Stuart, Lou Baron, and later in my life, Neal Groman, in essence all taught me that there is nothing better or that entails more responsibility as that moment when someone asks you to become a part of their life and to help them learn."*

Dr. Falkow was the type of mentor that was not a micromanager, rather he gave his students the independence to pursue their scientific curiosity. Dr. Kaper described Dr. Stanley Falkow as an encouraging teacher who helped everyone expand on their scientific and personal capabilities. Dr. Falkow wrote: "Then, it's a matter of listening, telling them to do what they already want to do and treating them as you wanted to be treated when you were a young scientist." As such, Dr. Falkow's mentoring style lives on in his students, and undoubtedly has fostered well-rounded scientists.

Most graduate students do not have to worry about leaving the lab with a project, as most of us move on to postdocs, possibly in completely different fields of study. As a postdoc, however, there is the concern that what you work on may not be yours to take with you once you finish. This was never an issue for the postdocs in Dr. Falkow's lab. "He was extremely generous, letting his trainees, primarily his postdocs, leave with their own projects", Dr. Kaper informed me. It is, therefore, not surprising to see just how vast of a range Dr. Falkow had when it came to his scientific research, and the breadth of organisms that he worked on. It was easy to see just how much of an impact Dr. Falkow had on his students as I talked with Dr. Kaper. I was grateful to be able to share memories with Dr. Kaper as he flipped through all the letters, articles, and various other mementos of Dr. Falkow. I learned that he was a very humble and modest person, yet was supportive of all his students. He was sentimental and despite his memorable and great lectures, a nervous speaker. I asked Dr. Kaper what Dr. Falkow might say to us graduate students and junior scientists that are just beginning our career. Dr. Kaper stated: "[Dr. Falkow] would probably encourage them to follow their hunches. He would tell them to pursue their interests, to chase after that experiment that they thought of. Most importantly to be persistent and don't be discouraged even if others are telling you not to do that experiment. Don't be afraid to try something new, whether that's a new field or a new organism."

After talking with both Dr. Bavoil and Dr. Kaper, it feels like attempting to write an article celebrating the life of Dr. Stanley Falkow does not do him justice. There is no doubt that he deserves the moniker "the father of microbial pathogenesis." His scientific contributions are numerous and serve as the foundation of our current work. Let us not forget though that behind the scientist, Dr. Falkow was also a person and a mentor to many. As Dr. Falkow expressed, our contribution to science is not just limited to our work but to the mentorship that we give. While we may be mentors to others, we can also still be students and learn from one another. At the end of the day, we are not just scientists, but members of a global community. Dr. Falkow wrote in his letter to Dr. Kaper: "Science is not I, it is We." We can also not forget, as microbiologists, his thoughts from that 1998 article: "Infectious agents will emerge so long as there are microorganisms. Humans help the evolutionary process sometimes unwittingly and sometimes by arrogance or ignorance." Therefore, to truly understand ourselves and the interactions of the pathogen with the host, we must 'think like the microbe.'



Stanley Falkow, Ph.D. 1934-2018

MMI Fun at the 2019 Holiday RNE

2019 Baltimore Running Festival Gets MMI Students Running

Congratulations to Jeremy Ardanuy for taking home first place in the marathon with a time of 2 hours 27 minutes 16 seconds!

PUBLICATIONS

Singh, Z.N., Duong, V.H., Koka, R., Zou, Y., Sawhney, S., Tang, L., Baer, M.R., Ambulos, N., El Chaer, F., Emadi, A. High-Risk Acute Promyelocytic Leukemia with Unusual T/Myeloid Immunophenotype Successfully Treated with ATRA and Arsenic Trioxide-Based Regimen. J. Hematop. 2018 Sep;11(3):67-74 PMC6171103

Adige, S., Lapidus, R.G., Carter-Cooper, B.A., Duffy, A., Patzke, C., Law, J.Y., Baer, M.R., Ambulos, N.P., Zou, Y., Bentzen, S.M., Emadi, A. Equipotent Doses of Daunorubicin and Idarubicin for AML: a Meta-Analysis of Clinical Trials Versus in vitro Estimation. Cancer Chemother Pharmacol. 2019 Jun;83(6):1105-1112 PMC30968179

Lehman, S.S., Noriea, N., Aistleitner, K., Clark, T., Dooley, C., Gillespie, J.J., Kaur, S., Rahman, M.S., Azad, A.F., Hackstadt, T. The Rickettsia Ankyrin Repeat Protein 2 is a type IV secreted effector and co-localizes with markers of the endoplasmic reticulum. mBio. 2018 Jun 26;9(3). PMC6020290.

Gillespie, J.J., Driscoll, T.P., Verhoeve, V.I., Rahman, M.S., Macaluso, K.R., Azad, A.F. A Tangled Web: Origins of Reproductive Parasitism. Genome Biol Evol. 2018 Sep 1;10(9):2292-2309. PMC6133264.

Guillotte, M., Gillespie, J.J., Chandler, C.E., Rahman, M.S., Ernst, R.K., Azad, A.F. Rickettsia Lipid A biosynthesis utilizes the late acyltransferase LpxJ for secondary fatty acid addition. J. Bacteriol 2018 200(19)e00334-18. PMC6148475.

Baldin, C., Soliman, S., Jeon, H.H., Alkhazraji, S., Gebremariam, T., Bruno, V.M., Cornely, O.A., Sugrue, M.W., Wingard, J.R., Stevens, D., Edwards, J.E., Ibrahim, A.S. "PCR-based approach targeting Mucorales-specific gene family for the diagnosis of mucormycosis". Journal of Clinical Microbiology. 2018 Sep 25;56(10). PMC6156309

Watkins, T.N., Gebremariam, T., Swidergall, M., Shetty, A.C., Graf, K.T., Alqarihi, A., Alkhazraji, S., Alsaadi, A.I., Edwards, V.L., Filler, S.G., Ibrahim, A.S., Bruno, V.M. "Inhibition of EGFR signaling protects from Mucormycosis". mBio. 2018 Aug 14;9(4) PMC6094478

Andrianaki, A., Kyrmizi, I., Panopoulou, K., Baldin, C., Drakos, E., Soliman, S., Shetty, A.C., McCracken, C., Akoumianaki, T., Stylianou, K., Ioannou, P., Belle, V., Emilien, E., Beauvais, A., Samonis, G., Kontoyiannis, D.P., Andreakos, E., Bruno, V.M., Ibrahim, A.S., Chamilos, G. "Iron Restriction Inside Macrophages is an Essential Host Defense Mechanism Against Mucorales". Nature Communications. 2018 Aug 20;9(1):3333.

Chung, M., Teigen, L., Liu, H., Libro, S., Shetty ,A.C., Kumar, N., Zhao, X., Bromley, R.E., Tallon, L.J. Sadzewicz, L., Fraser, C.M., Rasko, D.R., Filler, S.G., Foster, J.F., Michalski, M.L., Bruno, V.M., Dunning Hotopp, J.C. "Targeted enrichment outperforms other enrichment techniques and enables more multi-species RNA-seq analyses". Scientific Reports. 2018 Sep 6;8(1):13377. PMC6127098

Vila, T., Kong, E.F., Ibrahim, A., Piepenbrink, K., Shetty, A.C., McCracken, C., Bruno, V., Jabra-Rizk, M.A. "Candida albicans quorum sensing molecule farnesol modulates Staphyloxanthin production and Activates the Thiol-based oxidative stress response in Staphylococcus aureus". Virulence. 2019 Dec;10(1):625-642 PMC6629188

Mohammadpour, H., Du, W., O'Neill, R., Khalili, S., Qiu, J., Repasky, E.A., McCarthy, P.L., Cao, X. Host-derived Spi6 provides granzyme B-independent protection of intestinal epithelial cells in murine GVHD. Biol Blood Marrow Transplant. 2018 Dec;24(12):2397-2408. PMC6286216

Du, W., Cao, X. Cytotoxic Pathways in Allogeneic Hematopoietic Cell Transplantation. Front Immunol. 2018 Dec 19;9:2979. PMC635278

Kumar, S., Leigh, N.D., Cao, X. The Role of Co-stimulatory/Co-inhibitory Signals in Graft-vs.-Host Disease. Front Immunol. 2018 Dec 21;9:3003. PMC6309815

O'Neill, R.E., Cao, X. Co-stimulatory and co-inhibitory pathways in cancer immunotherapy. Adv Cancer Res. 2019;143:145-194.

Skerry, C., Dziarski, R., Goldman, W.E., Carbonetti, N.H. Peptidoglycan recognition protein 4 suppresses early inflammatory responses to Bordetella pertussis and is required for sphingosine-1-phosphate receptor agonist-mediated attenuation of disease. Infection and Immunity 87(2):e00601-18

Scanlon, K.M., Skerry, C., Carbonetti, N.H. Association of pertussis toxin with severe pertussis disease. Toxins. 2019 Jun 27;11(7). PMC6669598

Cappello, F., Conway de Macario, E., Rappa, F., Zummo, G., Macario, A.J.L. Immunohistochemistry of human Hsp60 in health and disease: From autoimmunity to cancer. Methods Mol Biol. 2018;1709:293-305

Caruso Bavisotto, C., Graziano, F., Rappa, F., Marino Gammazza, A., Logozzi, M., Fais, S., Maugeri, R., Bucchieri, F., Conway de Macario, E., Macario, A.J.L., Cappello, F., Iacopino, D.G., Campanella, C. Exosomal chaperones and miRNAs in gliomagenesis: State-of-art and theranostics perspectives. Int J Mol Sci. 2018 Sep 5;19(9). PMC6164348

Marino Gammazza, A., Restivo, V., Baschi, R., Caruso Bavisotto, C., Cefalù, A.B., Accardi, G., Conway de Macario, E., Macario, A.J.L., Cappello, F., Monastero, R. Circulating molecular chaperones in subjects with Amnestic Mild Cognitive impairment and Alzheimer's disease: Data from the Zabùt Aging Project. J Alzheimers Dis. 2018 Dec 20.

Bulone, D., San Biagio, P.L., Quiñones-Ruiz, T., Rosario-Alomar, M., Lednev, I.K., Robb, F.T., Conway de Macario, E., Macario, A.J.L. A multipronged method for unveiling subtle structural-functional defects of mutant chaperone molecules causing human chaperonopathies. Methods Mol Biol. 2019;1873:69-92.

Caruso Bavisotto, C., Scalia, F., Marino Gammazza, A., Carlisi, D., Bucchieri, F., Conway de Macario, E., Macario, A.J.L., Cappello, F., Campanella, C. Extracellular vesicle-mediated cell-cell communication in the nervous system: Focus on neurological diseases. Int J Mol Sci. 2019 Jan 20;20(2). PMC6359416

Cappello, F., Mazzola, M., Jurjus, A., Zeenny, M.N., Jurjus, R., Carini, F., Leone, A., Bonaventura, G., Tomasello, G., Bucchieri, F., Conway de Macario, E., Macario, A.J.L. Hsp60 as a novel target in IBD management: A Prospect. Front Pharmacol. 2019 Feb 8;10:26. PMC6376446

Conway de Macario, E., Yohda, M., Macario, A.J.L., Robb, F.T. Bridging human chaperonopathies and microbial chaperonins. Commun Biol. 2019 Mar 15;2:103. PMC6420498

Martinez, F.L., Anton, B.P., DasSarma, P., Rajal, V., Irazusta, V., Roberts, R.J., DasSarma, S. Complete Genome Sequence and Methylome Analysis of Micrococcus luteus SA211, a Halophilic, Lithium-Tolerant Actinobacterium from Argentina. Microbiology Resource Announcements 2019 Jan 24; 8(4) PMC6346199

Anton, B.P., DasSarma, S., DasSarma, P., Laye, V.J., Guzman, D., Roberts, R.J., Genome Sequence and Methylation Patterns of Halorubrum sp. Strain BOL3-1, the First Haloarchaeon Isolated and Cultured from Salar de Uyuni, Bolivia. Microbiology Resource Announcements 2019 May 9;8(19) PMC6509532

Schwieterman E.W., Kiang N.Y., Parenteau M.N., Harman C.E., DasSarma S., Fisher, T.M., Arney, G.N., Hartnett, H.E., Reinhard, C.T., Olson, S.L., Meadows, V.S., Cockell, C.S., Walker, S.I., Grenfell, J.L., Hegde, S., Rugheimer, S., Hu, R., and Lyons, T.W. Exoplanet Biosignatures: A Review of Remotely Detectable Signs of Life. Astrobiol. 2018 June; 18(6):663-708 PMC6016574

Meadows, V.S., Reinhard, C.T, Arney, G.N., Parenteau, M.N., Schwieterman, E.W., Domagal-Goldman, S.D., Lincowski, A.P., Stapelfeldt, K.R., Rauer, H., DasSarma, S., Hegde, S., Narita, N., Deitrick, R., Lustig-Yaeger, J., Lyons, T.W., Siegler, N., and Grenfell, J.L. Exoplanet Biosignatures: Understanding Oxygen as a Biosignature in the Context of Its Environment. Astrobiol. 2018 June; 18(6):630-662 PMC6014580

Catling, D.C., Krissansen-Totton, J., Kiang, N.Y., Crisp, D., Robinson, T.D., DasSarma, S., Rushby, A.J., Del Genio, A., Bains, W., and Domagal-Goldman, S. A Framework for assessing exoplanet biosignatures, Astrobiol. 18(6): DOI: 10.1089/ast.2017.1737.

Walker, S., Bains W., Cronin L., DasSarma, S., Danielache, S., Domagal-Goldman, S., Kacar, B., Kiang, N.Y., Lenardic, A., Reinhard, C.T., Moore, W., Schwieterman, E.W., Shkolnik, E.L., and Smith, H.B. Exoplanet Biosignatures: Future Directions. Astrobiol. 2018 June;18(6):779-824. PMC6016573

DasSarma, S. and Schwieterman, E.W. Early evolution of purple retinal pigments on Earth and implications for exoplanet biosignatures. International Journal of Astrobiology (Cambridge University Press) https://doi.org/10.1017/S1473550418000423.

Muller, W.J., Smith, M.S., van Heerden, E., Capes, M.D., DasSarma, S. Complex Effects of Cytochrome P450 Monooxygenase on Purple Membrane and Bacterioruberin Production in an Extremely Halophilic Archaeon: Genetic, Phenotypic, and Transcriptomic Analyses, Front. Microbiol. 2018 Oct 26;9:2563 PMC6212597

Redmond, A.K., Zou, J., Secombes, C.J., Macqueen, D.J., Dooley, H. Discovery of all three types in cartilaginous fishes enables phylogenetic resolution of the origins and evolution of interferons. Frontiers in Immunology. 10; article 1558.

Matz, H., Dooley, H. Shark IgNAR-derived binding domains as a source of diagnostic and biotherapeutic agents. Developmental & Comparative Immunology. 2019 Jan;90; 100-107 PMC30236879

Redmond, A.K., Macqueen, D.J., Dooley, H. Phylotranscriptomics suggests the jawed vertebrate ancestor could generate diverse helper and regulatory T cell subsets. BMC Evolutionary Biology. 2019 Nov 15;18(1):169. PMC6238376

Redmond, A.K., Ohta, Y., Criscitiello, M.F., Macqueen, D.J., Flajnik, M.F., Dooley, H. Haptoglobin is a divergent MASP family member that neofunctionalized to recycle hemoglobin via CD163 in mammals. Journal of Immunology. 2018 Oct 15;201(8); 2483-2491 PMC6179929

Dooley, H. Chondrichthyes: The immune system of cartilaginous fishes. Advances in Comparative Immunology. Springer press. Editor Edwin L. Cooper. p659-685 [Book Chapter]

Chung, M, Munro, J.B., Tettelin, H., Dunning Hotopp, J.C. Using core genome alignments to assign bacterial species. mSystems. 2018 Nov-Dec; 3(6) PMC6280431

Estes A. M., Hearn, D.J., Nadendla, S., Pierson, E.A., Dunning Hotopp, J.C. Draft genome sequence of Enterobacter sp. strain OLF, a colonizer of olive flies. Microbiol Resour Announc. 2018 Sep 6;7(9) PMC6256528

Chung M, Teigen, L., Libro, S., Bromley, R.E., Kumar, N., Sadzewicz, L., Tallon, L.J., Foster, J.M., Michalski, M.L., Dunning Hotopp, J.C. Multispecies transcriptomics data set of Brugia malayi, its Wolbachia endosymbiont wBm, and Aedes aegypti across the B. malayi life cycle. Microbiol Resour Announc. 2018 Nov 8;7(18). PMC6256537

Estes A. M., Hearn, D.J., Nadendla, S., Pierson, E.A., Dunning Hotopp, J.C. Draft genome sequence of Erwinia dacicola, a dominant endosymbiont of olive flies. Microbiol Resour Announc. 2018 Sep 13;7(10). PMC6256602

Estes A. M., Hearn, D.J., Agrawal, S., Pierson, E.A., Dunning Hotopp, J.C. Comparative genomics of the Erwinia and Enterobacter olive fly endosymbionts. Sci Rep. 2018 Oct 29;8(1):15936. PMC620599

Kessler M. D., Bateman, N.W., Conrads, T.P., Maxwell, G.L., Dunning Hotopp, J.C., O'Connor, T.D. Ancestral characterization of 1018 cancer cell lines highlights disparities and reveals gene expression and mutational differences. Cancer. 2019 Jun 15;125(12):2076-2088. PMC6541501

Lin, X., Liao, J., Yang, Z., Fan, X., Cullen, K.J., Chen, L., Dan, H. Inhibition of cisplatin-resistant head and neck squamous cell carci-

PUBLICATIONS

noma by combination of Afatinib with PD0325901, a MEK inhibitor. Am J Cancer Res. 2019 Jun 1;9(6):1282-1292. PMC6610054

Thayer, J.A., Awad, O., Hegdekar, N., Sarkar, C., Tesfay, H., Cameran, B., Feldman, R.A., Lipinski M.M. The PARK10 gene USP24 is a negative regulator of autophagy and ULK1 protein stability. Autophagy, 2019 Apr 7:1-14 PMC30957634

Kasahara, M., Flajnik, M.F., and Takahama, Y. Biology, evolution, and history of antigen processing and presentation: Immunogenetics special issue. Immunogenetics 2019 Mar;71(3):137-139. PMC6397649

Kasahara, M. and Flajnik, M.F. Origin and evolution of the specialized forms of proteasomes involved in antigen presentation. Immunogenetics 2019 Mar;71(3):251-261. PMC6377343

Feng, M., Bian, H., Wu, X., Fu, T., Fu, Y., Hong, J., Fleming, B.D., Flajnik, M.F., Ho, M. Construction and next-generation sequencing analysis of a large phage-displayed VNAR single-domain antibody library from six naïve nurse sharks. Antib Ther. 2019 Jan; 2(1):1-11. PMC6312525

Yaari, G., Flajnik, M.F., Hershberg, U. Questions of Stochasticity and Control in Immune Repertoires. Trends Immunol. 2018 Nov;39 (11):859-861.

Flajnik, M.F. A Convergent Holy Trinity of Adaptive Immunity in Lampreys: Discovery of the Variable Lymphocyte Receptors. J. Immunol. 2018 Sep 1;201(5):1331-1335.

Banerjee, A., Kulcsar, K., Misra, V., Frieman, M., Mossman, K. Bats and Coronaviruses. Viruses. 2019 Jan 9;11(1). PMC6356540.

Weston, S., Matthews, K.L., Lent, R., Vlk, A., Haupt, R., Kingsbury, T., Frieman MB. A Yeast Suppressor Screen Used To Identify Mammalian SIRT1 as a Proviral Factor for Middle East Respiratory Syndrome Coronavirus Replication. J Virol. 2019 Jul 30;93(16).

Puhl, A.C., Garzino Demo, A., Makarov, V.A., Ekins, S. New targets for HIV drug discovery. Drug Discov Today. 2019 May;24 (5):1139-1147. PMC6510608

Huston, W.M., Coers, J., Garzino-Demo, A. Fresh faces and new approaches at Pathogens and Disease. Pathog Dis. 2019 Feb 1;77 (1).

Driscoll, T.P., Hagen, R., Verhoeve, V.I., Gillespie, J.J. Conjugative Transposons and Their Cargo Genes Vary across Natural Populations of Rickettsia buchneri Infecting the Tick Ixodes scapularis.,. Genome Biol Evol. 2018 Dec 1;10(12):3218-3229. PMC6300072

Perkins, D.J., Richard, K., Hansen, A.M., Lai, W., Nallar, S., Koller, B., Vogel, S.N. Autocrine-paracrine prostaglandin E2 signaling restricts TLR4 internalization and TRIF signaling. Nature Immunology. 2018 Dec;19 (12): 1309-1318. PMC6240378

Boisen, N., Melton-Celsa, A.R., Hansen, A.M., Zangari, T., Smith, M., Russo, L.M., Scheutz, F., O'Brien, A.D., Nataro, J.P. The role of the AggR regulon in the virulence of the Shiga toxin-producing enteroaggregative Escherichia coli epidemic O104:H4 strain in mice. Frontiers in Microbiology. 2019 July. DOI:10.3389/fmicb.2019.01824.

Han, M., Bentley, J.K., Rajput, C., Lei, J., Ishikawa, T., Jarman, C.R., Lee, J., Goldsmith, A.M., Jackson, W.T., Hoenerhoff, M.J., Lewis, T.C., Hershenson, M.B. Inflammasome activation is required for human rhinovirus-induced airway inflammation in naive and allergen-sensitized mice. Mucosal Immunol. 2019 Jul;12(4):958-968. PMC6668626

Rajput, C., Han, M., Bentley, J.K., Lei, J., Ishikawa, T., Wu, Q., Hinde, J.L., Callear, A.P., Stillwell, T.L., Jackson, W.T., Martin, E.T., Hershenson, M.B. Enterovirus D68 infection induces IL-17-dependent neutrophilic airway inflammation and hyperresponsiveness. JCI Insight. 2018 Aug 23;3(16). PMC6141171

Corona Velazquez, A.F., Jackson, W.T. So Many Roads: the Multifaceted Regulation of Autophagy Induction. Mol Cell Biol. 2018 Oct 15;38(21). PMC6189458

Corona, A.K., Jackson, W.T. Finding the Middle Ground for Autophagic Fusion Requirements. Trends Cell Biol. 2018 Nov;28 (11):869-881. PMC6197918

Corona, A.K., Mohamud, Y., Jackson, W.T., Luo, H.. Oh, SNAP! How enteroviruses redirect autophagic traffic away from degradation. Autophagy. 2018;14(8):1469-1471. PMC6103677

Shtanko, O., Reyes, A.N., Jackson, W.T., Davey, R.A. Autophagy-Associated Proteins Control Ebola Virus Internalization Into Host Cells. J Infect Dis. 2018 Nov 22;218 (suppl_5):S346-S354. PMC6249560

Corona Velazquez, A., Corona, A.K., Klein, K.A., Jackson, W.T. Poliovirus induces autophagic signaling independent of the ULK1 complex. Autophagy. 2018;14(7):1201-1213. PMC6103675

Ilangumaran, S., Moriggl, R., Kalvakolanu, D.V. Editorial: Cytokines in liver diseases. Cytokine. 2018 Dec 15.

Zhao, Y., Liu, H., Xu, L., Guo, B., Kalvakolanu, D.V., Liu, X., Hu, J., Zhang, D., Sun, Y., Zhang, L., Xu, D., Zhao, X. Synergistic Suppression of Melanoma Growth by a Combination of Natural dsRNA and Panaxadiolsaponins. J Interferon Cytokine Res. 2018 Sep;38(9):378-87.

De Nardo, D., Kalvakolanu, D.V., Latz, E. Immortalization of Murine Bone Marrow-Derived Macrophages. Methods Mol Biol. 2018;1784:35-49.

Keay, S., Nallar, S.C., Gade, P., Zhang, C.O., Kalvakolanu, D.V. Oncosuppressor protein p53 and cyclin-dependent kinase inhibitor p21 regulate interstitial cystitis associated gene expression. Cytokine. 2018 Oct;110:115.

Ilangumaran, S., Williams, B.R.G., Kalvakolanu, D.V. Meeting summary: 2nd Aegean Conference on Cytokine Signaling in Cancer. Cytokine.2018 Aug;108:225-31.

Tse, C.M., In, J.G., Yin, J., Donowitz, M., Doucet, M., Foulke-Abel, J., Ruiz-Perez, F., Nataro, J.P., Zachos, N.C., Kaper, J.B., Kovbasnjuk, O. Enterohemorrhagic E. coli (EHEC)-Secreted Serine Protease EspP Stimulates Electrogenic Ion Transport in Human Colonoid Monolayers. Toxins (Basel). 2018 Sep 1;10(9). PMC6162544.

Roxas, J.L., Monasky, R.C., Roxas, B.A.P., Agellon, A.B., Mansoor, A., Kaper, J.B., Vedantam, G., Viswanathan, V.K. Enteropathogenic Escherichia coli EspH-Mediated Rho GTPase Inhibition Results in Desmosomal Perturbations. Cell Mol Gastroenterol Hepatol. 2018 Apr 27;6(2):163-180. PMC6039986

Runte, C.S., Jain, U., Getz, L.J., Secord, S., Kuwae, A., Abe, A., LeBlanc, J.J., Stadnyk, A.W., Kaper, J.B., Hansen, A.M., Thomas, N.A. Tandem tyrosine phosphosites in the Enteropathogenic Escherichia coli chaperone CesT are required for differential type III effector translocation and virulence. Mol Microbiol. 2018 Jun;108(5):536-550.

Clark, S. M., Song, C., Li, X., Keegan, A. D., and Tonelli, L.H. CD8+ T Cells Promote Cytokine Responses to Stress. Cytokine. 2019 Jul;113:256-264 PMC6289779

Roberts, N.B., Alquazzaz, A., Qi, X., Keegan, A.D., Kim, A.J., Winkles, J.A., and Woodworth, G.F. Oxaliplatin promotes alternative effects in glioma cells and glioma cell conditioned media-treated macrophages apart from induction of apoptosis. J Neurooncol. 2018 Aug 21.

Chapoval, S.P. Hritzo, M., Qi, X., Tamagnone, L., Golding, A. and Keegan, A.D. Semaphorin 4A stabilizes human Treg phenotype via Plexin B1. Immuno Horizons. 2019 Feb;3(2) 71-87. PMC6590919

Latinovic, O.S., Neal, L.M., Heredia, A., Tagaya, Y., Medina-Moreno, S., Zapata, J.C., Reitz, M., Bryant, J., Redfield, R.R., Suppression of Active and Persistent HIV-1 Infection in CD34+ Hematopoietic Humanized Mice by Combination of Long Acting cART Therapy and CCR5 Targeting Drugs. AIDS Research and Human Retroviruses. 2019 June 25.

Zhang, Y., Du, X., Liu, M., Tang, F., Zhang, P., Ai, C., Fields, J., Sundberg, E., Latinovic, O.S., Devenport, M., Zheng, P. Liu, Y. Hijacking antibody-induced CTLA-4 lysosomal degradation for safer and more effective cancerimmunotherapy. Cell Research. 2019 Aug;29(8):609-627.

Latinovic, O.S., Reitz, M., Heredia, A., CCR5 Inhibitors and HIV-1 Infection. Journal of AIDS and HIV Treatment, Vol 1, Issue 1. 2019

Visciano, M.L., Gohain, N., Sherburn, R., Orlandi, C., Flinko, R., Dashti, A., Lewis, G.K., Tolbert, W.D., Pazgier, M. Induction of Fc-Mediated Effector Functions Against a Stabilized Inner Domain of HIV-1 gp120 Designed to Selectively Harbor the A32 Epitope Region. Frontiers in immunology. 2019;10:677. PMCID: PMC6455405.

Tolbert, W.D., Subedi, G.P., Gohain, N., Lewis, G.K., Patel, K.R., Barb, A.W., Pazgier, M. From Rhesus macaque to human: structural evolutionary pathways for immunoglobulin G subclasses. mAbs. 2019 May/Jun;11(4):709-724. PMC6601566

Sui, Y., Lewis, G.K., Wang, Y., Berckmueller, K., Frey, B., Dzutsev, A., Vargas-Inchaustegui, D., Mohanram, V., Musich, T., Shen, X., DeVico, A., Fouts, T., Venzon, D., Kirk, J., Waters, R.C., Talton, J., Klinman, D., Clements, J., Tomaras, G.D., Franchini, G., Robert-Guroff, M., Trinchieri, G., Gallo, R.C., Berzofsky, J.A. Mucosal vaccine efficacy against intrarectal SHIV is independent of anti-Env antibody response. The Journal of clinical investigation. 2019;129(3):1314-28. PMC6391089.

Schmaljohn, A.L., Orlandi, C., Lewis, G.K. Deciphering Fc-mediated Antiviral Antibody Functions in Animal Models. Frontiers in immunology. 2019 Jul 17;10:1602. PMC6652135.

Rosenberg, Y.J., Lewis, G.K., Montefiori, D.C., LaBranche, C.C., Lewis, M.G., Urban, L.A., Lees, J.P., Mao, L., Jiang, X. Introduction of the YTE mutation into the non-immunogenic HIV bnAb PGT121 induces anti-drug antibodies in macaques. PloS one. 2019 Feb 20;14(2):e0212649. PMC6437720

Ray, K., Mengistu, M., Orlandi, C., Pazgier, M., Lewis, G.K., DeVico, A.L. Concurrent Exposure of Neutralizing and Non-neutralizing Epitopes on a Single HIV-1 Envelope Structure. Frontiers in immunology. 2019 Jul 5;10:1512. PMC6628914.

Pittala, S., Bagley, K., Schwartz, J.A., Brown, E.P., Weiner, J.A., Prado, I.J., Zhang, W., Xu, R., Ota-Setlik, A., Pal, R., Shen, X., Beck, C., Ferrari, G., Lewis, G.K., LaBranche, C.C., Montefiori, D.C., Tomaras, G.D., Alter, G., Roederer, M., Fouts, T.R., Ackerman, M.E., Bailey-Kellogg, C. Antibody Fab-Fc properties outperform titer in predictive models of SIV vaccine-induced protection. Mol Syst Biol. 2019 May 2;15(5):e8747. PMC6497031.

Kardava, L., Sohn, H., Youn, C., Austin, J.W., Wang, W., Buckner, C.M., Justement, J.S., Melson, V.A., Roth, G.E., Hand, M.A., Gittens, K.R., Kwan, R.W., Sneller, M.C., Li, Y., Chun, T.W., Sun, P.D., Pierce, S.K., Moir, S.. IgG3 regulates tissue-like memory B cells in HIV-infected individuals. Nature Immunology. 2018 Sep;19(9):1001-1012 PMC6289069

Janus, B.M., van Dyk, N., Zhao, X., Howell, K.A., Soto, C., Aman, M.J., Li, Y., Fuerst, T.R., Ofek, G. Structural basis for broad neutralization of ebolaviruses by an antibody targeting the glycoprotein fusion loop. Nature Communications. 2018 Sep;9(1):3934 PMC6158212

Brannan, J.M., He, S., Howell, K.A., Prugar, L.I., Zhu, W., Vu, H., Shulenin, S., Kailasan, S., Liao, G., Raina, H., Wong, G., Rahim, M.N., Banadyga, L., Tierney, K., Zhao, X., Li, Y., Holtsberg, F.W., Dye, J.M., Qiu, X., Aman, M.J. Post-exposure immunotherapy for two ebolaviruses and Marburg virus in nonhuman primates. Nature Communications. 2019 Jan 10;10(1):105 PMC6328579

Lei, L., Yang, Y.R., Tran, K., Wang, Y., Chiang, C.I., Ozorowski, G., Xiao, Y., Ward, A.B., Wyatt, R.T., Li, Y. The HIV-1 Envelope Glycoprotein C3/V4 Region Defines a Prevalent Neutralization Epitope following Immunization. Cell Reports. 2019 Apr 9; 27(2):586-598 PMC6458978

PUBLICATIONS

Lei, L., Tran, K., Wang, Y., Steinhardt, J.J., Xiao, Y., Chiang, C.I., Wyatt, R.T., Li, Y. Antigen-Specific Single B Cell Sorting and Monoclonal Antibody Cloning in Guinea Pigs. Frontiers in Microbiology 2019 Apr 23;10: 672. PMC6489837

Cappello, F., Macario, A.J.L. Depleted uranium induces human carcinogenesis involving the immune and chaperoning systems: Realities and working hypotheses. Med Hypotheses. 2019 Mar;124:26-30.

Marino Gammazza, A., Caruso Bavisotto, C., Macario, A.J.L. Physiology and pathophysiology of heat shock protein 60. Front. Mol. Biosc. 2019

Zeichner, S.L., Mongodin, E.F., Hittle, L., Huang, S.H., Torres, C. The bacterial communities of the small intestine and stool in children with short bowel syndrome. PLoS One. 2019 May 16;14(5):e0215351. PMC6521997.

Khamash, D.F., Mongodin, E.F., White, J.R., Voskertchian, A., Hittle, L., Colantuoni, E., Milstone, A.M. The Association Between the Developing Nasal Microbiota of Hospitalized Neonates and Staphylococcus aureus Colonization. Open Forum Infect Dis. 2019 Mar 21;6(4):ofz062. PMC6441571.

Hosgood, H.D., 3rd., Mongodin, E.F., Wan, Y., Hua, X., Rothman, N., Hu, W., Vermeulen, R., Seow, W.J., Rohan, T., Xu, J., Li, J., He, J., Huang, Y., Yang, K., Wu, G., Wei, F., Shi, J., Sapkota, A.R., Lan, Q. The Respiratory Tract Microbiome and Its Relationship to Lung Cancer and Environmental Exposures Found in Rural China. Environ Mol Mutagen. 2019 Aug;60(7):617-623.

Allard, S.M., Solaiman, S., Callahan, M.T., Bui, A., Craddock, H., Haymaker, J., Foust, D., Duncan, R., Smyth, E., Mongodin, E.F., Hashem, F., May, E., Micallef, S.A., Sapkota, A.R. Quenching by sodium thiosulfate does not influence 16S rRNA gene sequencing profiles of reclaimed water from three sites in the Mid-Atlantic, United States. Environ Res. 2019 May;172:296-300.

Allard, S.M., Callahan, M.T., Bui, A., Ferelli, A.M.C., Chopyk, J., Chattopadhyay, S., Mongodin, E.F., Micallef, S.A., Sapkota, A.R. Creek to Table: Tracking fecal indicator bacteria, bacterial pathogens, and total bacterial communities from irrigation water to kale and radish crops. Sci Total Environ. 2019 May 20;666:461-471.

Chattopadhyay, S., Smyth, E.M., Kulkarni, P., Babik, K.R., Reid, M., Hittle, L.E., Clark, P.I., Mongodin, E.F.*, Sapkota, A.R.* Little cigars and cigarillos harbor diverse bacterial communities that differ between the tobacco and the wrapper. PLoS One. 2019 Feb 22;14 (2):e0211705. PMC6386278. *Co-senior authors

Chien, A.L., Tsai, J., Leung, S., Mongodin, E.F., Nelson, A.M., Kang, S., Garza, L.A. Association of Systemic Antibiotic Treatment of Acne With Skin Microbiota Characteristics. JAMA Dermatol. 2019 Feb 13. PMC6459106.

Schutzer, S.E., Body, B.A., Boyle, J., Branson, B.M., Dattwyler, R.J., Fikrig, E., Gerald, N.J., Gomes-Solecki, M., Kintrup, M., Ledizet, M., Levin, A.E., Lewinski, M., Liotta, L.A., Marques, A., Mead, P.S., Mongodin, E.F., Pillai, S., Rao, P., Robinson, W.H., Roth, K.M., Schriefer, M.E., Slezak, T., Snyder, J.L., Steere, A.C., Witkowski, J., Wong, S.J., Branda, J.A. Direct Diagnostic Tests for Lyme Disease. Clin Infect Dis. 2019 Mar 5;68 (6):1052-1057. PMC6399434.

Bromberg, J.S., Hittle, L., Xiong, Y., Saxena, V., Smyth, E.M., Li, L., Zhang, T., Wagner, C., Fricke, W.F., Simon, T., Brinkman, C.C., Mongodin, E.F. Gut microbiota-dependent modulation of innate immunity and lymph node remodeling affects cardiac allograft outcomes. JCI Insight. 2018 Oct 4;3(19). PMC6237453.

Koutsourelakis, I., Halderman, A., Khalil, S., Hittle, L.E., Mongodin, E.F., Lane, A.P. Temporal instability of the post-surgical maxillary sinus microbiota. BMC Infect Dis. 2018 Aug 30;18(1):441. PMC6117940.

Kulkarni, P., Olson, N.D., Paulson, J.N., Pop, M., Maddox, C., Claye, E., Rosenberg Goldstein, R.E., Sharma, M., Gibbs, S.G., Mongodin, E.F., Sapkota, A.R. Conventional wastewater treatment and reuse site practices modify bacterial community structure but do not eliminate some opportunistic pathogens in reclaimed water. Sci Total Environ. 2018 Oct 15;639:1126-1137.

Coleman, M., Elkins, C., Gutting, B., Mongodin, E., Solano-Aguilar, G., Walls, I. Microbiota and Dose Response: Evolving Paradigm of Health Triangle. Risk Anal. 2018 Oct;38 (10):2013-2028.

Dudics, S., Venkatesha, S.H., Moudgil, K.D. The Micro-RNA Expression Profiles of Autoimmune Arthritis Reveal Novel Biomarkers of the Disease and Therapeutic Response. International Journal of Molecular Sciences. 2018 Aug 5;19(8). PMC6121685

Guo, W., Imai, S., Yang, J.L., Zou, S., Li, H., Xu, H., Moudgil, K.D., Dubner, R., Wei, F., Ren, K. NF-KappaB Pathway Is Involved in Bone Marrow Stromal Cell-Produced Pain Relief. Frontiers in Integrative Neuroscience. 2018 Oct 16;12:49. PMC6232783

Langan, D., Kim, E.Y., Moudgil, K.D. Modulation of autoimmune arthritis by environmental 'hygiene' and commensal microbiota. Cellular Immunology. 2019 May;339:59-67.

Dudics, S., Langan, D., Meka, R.R., Venkatesha, S.H., Berman, B.M., Che, C.T., Moudgil, K.D. Natural Products for the Treatment of Autoimmune Arthritis: Their Mechanisms of Action, Targeted Delivery, and Interplay with the Host Microbiome. International Journal of Molecular Sciences. 2018 Aug 24;19(9). PMC6164747

Meka, R. R., Venkatesha, S.H., Acharya, B., Moudgil, K.D. Peptide-targeted liposomal delivery of dexamethasone for arthritis therapy. Nanomedicine (London, England). 2019 Jun;14:1455-1469. PMC6613046

Moudgil, K. D. Advances in the pathogenesis and treatment of autoimmunity. Cellular Immunology. 2019 May;339:1-3.

Venkatesha, S. H., Moudgil, K.D. Celastrol suppresses experimental autoimmune encephalomyelitis via MAPK/SGK1-regulated mediators of autoimmune pathology. Inflamm Res. 2019 Apr;68:285-296. PMC6517245

Meka, R. R., Venkatesha, S.H., Moudgil, K.D. Peptide-directed liposomal delivery improves the therapeutic index of an immunomodulatory cytokine in controlling autoimmune arthritis. J Control Release. 2018 Sep 28;286:279-288. PMC6138574

Venkatesha, S. H., Dudics, S., Song, Y., Mahurkar, A., Moudgil, K.D. The miRNA Expression Profile of Experimental Autoimmune Encephalomyelitis Reveals Novel Potential Disease Biomarkers. International Journal of Molecular Sciences. 2018 Dec 11;19(12). PMC6321564

McClure Carroll, E.E., Wang, X., Shaw, D.K., O'Neal, A., Oliva Chávez, A.S., Brown, L.J., Mahendra Boradia, V.M., Hammond, H.L., Pedra, J.H.F. p47 licenses activation of the Immune Deficiency pathway in the tick Ixodes scapularis. Proc Natl Acad Sci. 2019 Jan 2;116: 205-210. PMC6320499

Oliva Chavez, A.S. , O'Neal, A.J. , Santambrogio, L., Kotsyfakis, M., Pedra, J.H.F. Message in a vesicle - transkingdom intercommunication at the vector-host interface. Journal of Cell Science. 2019 Mar 18;132(6. PMC6451414

Higginson, E.E., Ramachandran, G., Panda, A., Shipley, S.T., Kriel, E.H., DeTolla, L.J., Lipsky, M., Perkins, D.J., Salerno-Goncalves, R., Sztein, M.B., Pasetti, M.F., Levine, M.M., Tennant, S.M. Improved Tolerability of a Salmonella enterica Serovar Typhimurium Live-Attenuated Vaccine Strain Achieved by Balancing Inflammatory Potential with Immunogenicity. Infect Immun. 2018 Nov 20;86(12). PMC6246900

Shirey, K.A., Perkins, D.J., Lai, W., Zhang, W., Fernando, L.R., Gusovsky, F., Blanco, J.C.G., Vogel, S.N. Influenza "Trains" the Host for Enhanced Susceptibility to Secondary Bacterial Infection. MBio. 2019 May 7;10 (3). PMC6509193

Hazen, T.H., Mettus, R., McElheny, C.L., Bowler, S.L., Nagaraj, S., Doi, Y., Rasko, D.A. Diversity among blaKPC-containing plasmids in Escherichia coli and other bacterial species isolated from the same patients. Sci Rep. 2018 Jul 6;8(1):10291. PMC6035167

Richter, T.K.S., Michalski, J.M., Zanetti, L., Tennant, S.M., Chen, W.H., Rasko, D.A. Responses of the Human Gut Escherichia coli Population to Pathogen and Antibiotic Disturbances. mSystems. 2018 Jul 24;3(4). PMC6060285

Ndungo. E., Randall, A., Hazen, T.H., Kania, D.A., Trappl-Kimmons, K., Liang, X., Barry, E.M., Kotloff, K.L., Chakraborty, S., Mani, S., Rasko, D.A., Pasetti, M.F. A Novel Shigella Proteome Microarray Discriminates Targets of Human Antibody Reactivity following Oral Vaccination and Experimental Challenge. mSphere. 2018 Aug 1;3(4). PMC6070737

Richter, T.K.S., Hazen, T.H., Lam, D., Coles, C.L., Seidman, J.C., You, Y., Silbergeld, E.K., Fraser, C.M., Rasko, D.A. Temporal Variability of Escherichia coli Diversity in the Gastrointestinal Tracts of Tanzanian Children with and without Exposure to Antibiotics. mSphere. 2018 Nov 7;3 (6). PMC6222053

Cádiz, L., Torres, A., Valdés, R., Vera, G., Gutiérrez, D., Levine, M.M., Montero, D.A., O'Ryan, M., Rasko, D.A., Stine, O.C., Vidal, R., Del Canto, F. Coli Surface Antigen 26 Acts as an Adherence Determinant of Enterotoxigenic Escherichia coli and Is Cross-Recognized by Anti-CS20 Antibodies. Front Microbiol. 2018 Oct 16;9:2463. PMC6232838

Higginson, E.E., Ramachandran, G., Hazen, T.H., Kania, D.A., Rasko, D.A., Pasetti, M.F., Levine, M.M., Tennant, S.M. Improving Our Understanding of Salmonella enterica Serovar Paratyphi B through the Engineering and Testing of a Live Attenuated Vaccine Strain. mSphere. 2018 Nov 28;3(6). PMC6262260

Chandler, C.E., Horspool, A.M., Hill, P.J., Wozniak, D.J., Schertzer, J.W., Rasko, D.A., Ernst, R.K. Genomic and phenotypic diversity among ten laboratory isolates of Pseudomonas aeruginosa PAO1. J Bacteriol. 2019 Feb 11;201(5). PMC6379574

Vidal, R.M., Muhsen, K., Tennant, S.M., Svennerholm, A.M., Sow, S.O., Sur, D., Zaidi, A.K.M., Faruque, A.S.G., Saha, D., Adegbola, R., Hossain, M.J., Alonso, P.L., Breiman, R.F., Bassat, Q., Tamboura, B., Sanogo, D., Onwuchekwa, U., Manna, B., Ramamurthy, T., Kanungo, S., Ahmed, S., Qureshi, S., Quadri, F., Hossain, A., Das, S.K., Antonio, M., Mandomando, I., Nhampossa, T., Acácio, S., Omore, R., Ochieng, J.B., Oundo, J.O., Mintz, E.D., O'Reilly, C.E., Berkeley, L.Y., Livio, S., Panchalingam, S., Nasrin, D., Farag, T.H., Wu, Y., Sommerfelt, H., Robins-Browne, R.M., Del Canto, F., Hazen, T.H., Rasko, D.A., Kotloff, K.L., Nataro, J.P., Levine, M.M. Colonization factors among enterotoxigenic Escherichia coli isolates from children with moderate-to-severe diarrhea and from matched controls in the Global Enteric Multicenter Study (GEMS). PLoS Negl Trop Dis. 2019 Jan 4;13(1):e0007037. PMC6343939

Montero, D.A., Canto, F.D., Velasco, J., Colello, R., Padola, N.L., Salazar, J.C., Martin, C.S., Oñate, A., Blanco, J., Rasko, D.A., Contreras, C., Puente, J.L., Scheutz, F., Franz, E., Vidal, R.M. Cumulative acquisition of pathogenicity islands has shaped virulence potential and contributed to the emergence of LEE-negative Shiga toxin-producing Escherichia coli strains. Emerg Microbes Infect. 2019;8(1):486-502. PMC6455142

Hazen, T.H., Nagaraj, S., Sen, S., Permala-Booth, J., Del Canto, F., Vidal, R.M., Barry, E.M., Bitoun, J.P., Chen, W.H., Tennant, S.M., Rasko, D.A. Genome and Functional Characterization of Colonization Factor Antigen I- and CS6-Encoding Heat-Stable Enterotoxin-Only Enterotoxigenic Escherichia coli Reveals Lineage and Geographic Variation. mSystems. 2019 Jan 15;4(1). pii: e00329-18. doi: 10.1128/mSystems.00329-18. PMID:30944874

Bornstein, K., Tennant, S.M., Hazen, T.H., Sorkin, J.D., Tapia, M.D., Sow, S.O., Onwuchekwa, U., Levine, M.M., Rasko, D.A. Ge-

PUBLICATIONS

netic changes associated with the temporal shift in invasive non-typhoidal Salmonella serovars in Bamako Mali. PLoS Negl Trop Dis. 2019 Jun 6;13(6):e0007297. PMC6592554

Nugeyre, M.T., Tchitchek, N., Adapen, C., Cannou, C., Contreras, V., Benjelloun, F., Ravel, J., Le Grand, R., Marlin, R., Menu, E. Dynamics of Vaginal and Rectal Microbiota Over Several Menstrual Cycles in Female Cynomolgus Macaques. Front Cell Infect Microbiol. 2019;9:188. PMC6582644.

Murall, C.L., Rahmoun, M., Selinger, C., Baldellou, M., Bernat, C., Bonneau, M., Boué, V., Buisson, M., Christophe, G., D'Auria, G., Taroni, F., Foulongne, V., Froissart, R., Graf, C., Grasset, S., Groc, S., Hirtz, C., Jaussent, A., Lajoie, J., Lorcy, F., Picot, E., Picot, M.C., Ravel, J., Reynes, J., Rousset, T., Seddiki, A., Teirlinck, M., Tribout, V., Tuaillon, É., Waterboer, T., Jacobs, N., Bravo, I.G., Segondy, M., Boulle, N., Alizon, S. Natural history, dynamics, and ecology of human papillomaviruses in genital infections of young women: protocol of the PAPCLEAR cohort study. BMJ Open. 2019 Jun 11;9 (6):e025129. PMC6576111.

Thurman, A.R., Schwartz, J.L., Ravel, J., Gajer, P., Marzinke, M.A., Yousefieh, N., Anderson, S.M., Doncel, G.F. Vaginal microbiota and mucosal pharmacokinetics of tenofovir in healthy women using tenofovir and tenofovir/levonorgestrel vaginal rings. PLoS One. 2019 May 20;14(5): e0217229. PMC6527208.

Jones, G.S., Spencer Feigelson, H., Falk, R.T., Hua, X., Ravel, J., Yu, G., Flores, R., Gail, M.H., Shi, J., Xu, X., Goedert, J.J. Mammographic breast density and its association with urinary estrogens and the fecal microbiota in postmenopausal women. PLoS One. 2019 May 8;14(5): e0216114. PMC6505928

Amann, R.I., Baichoo, S., Blencowe, B.J., Bork, P., Borodovsky, M., Brooksbank, C., Chain, P.S.G., Colwell, R.R., Daffonchio, D.G., Danchin, A., de Lorenzo, V., Dorrestein, P.C., Finn, R.D., Fraser, C.M., Gilbert, J.A., Hallam, S.J., Hugenholtz, P., Ioannidis, J.P.A., Jansson, J.K., Kim, J.F., Klenk, H.P., Klotz, M.G., Knight, R., Konstantinidis, K.T., Kyrpides, N.C., Mason, C.E., McHardy, A.C., Meyer, F., Ouzounis, C.A., Patrinos, A.A.N., Podar, M., Pollard, K.S., Ravel, J., Muñoz, A.R., Roberts, R.J., Rosselló-Móra, R., Sansone, S.A., Schloss, P.D., Schriml, L.M., Setubal, J.C., Sorek, R., Stevens, R.L., Tiedje, J.M., Turjanski, A., Tyson, G.W., Ussery, D.W., Weinstock, G.M., White, O., Whitman, W.B., Xenarios, I.. Consent insufficient for data release-Response. Science. 2019 May 3;364(6439):446.

Elovitz, M.A., Gajer, P., Riis, V., Brown, A.G., Humphrys, M.S., Holm, J.B., Ravel, J. Cervicovaginal microbiota and local immune response modulate the risk of spontaneous preterm delivery. Nat Commun. 2019 Mar 21;10(1):1305. PMC6428888.

Nowak, R.G., Bentzen, S.M., Ravel, J., Crowell, T.A., Dauda, W., Ma, B., Liu, H., Blattner, W.A., Baral, S.D., Charurat, M.E. Anal Microbial Patterns and Oncogenic Human Papillomavirus in a Pilot Study of Nigerian Men Who Have Sex with Men at Risk for or Living with HIV. AIDS Res Hum Retroviruses. 2019 Mar;35(3):267-275. PMC6434585.

McKinnon, L.R., Achilles, S.L., Bradshaw, C.S., Burgener, A., Crucitti, T., Fredricks, D.N., Jaspan, H.B., Kaul, R., Kaushic, C., Klatt, N., Kwon, D.S., Marrazzo, J.M., Masson, L., McClelland, R.S., Ravel, J., van de Wijgert, J.H.H.M., Vodstrcil, L.A., Tachedjian, G. The Evolving Facets of Bacterial Vaginosis: Implications for HIV Transmission. AIDS Res Hum Retroviruses. 2019 Mar;35(3):219-228 PMC6434601.

Holm, J.B., Humphrys, M.S., Robinson, C.K., Settles, M.L., Ott, S., Fu, L., Yang, H., Gajer, P., He, X., McComb, E., Gravitt, P.E., Ghanem, K.G., Brotman, R.M., Ravel, J. Ultrahigh-Throughput Multiplexing and Sequencing of >500-Base-Pair Amplicon Regions on the Illumina HiSeq 2500 Platform. mSystems. 2019 Feb 19;4 (1). PMC6381223.

McComb, E., Holm, J., Ma, B., Ravel, J. Complete Genome Sequence of Lactobacillus crispatus CO3MRSI1. Microbiol Resour Announc. 2019 Jan 31;8(5). PMC6357639.

Amann, R.I., Baichoo, S., Blencowe, B.J., Bork, P., Borodovsky, M., Brooksbank, C., Chain, P.S.G., Colwell, R.R., Daffonchio, D.G., Danchin, A., de Lorenzo, V., Dorrestein, P.C., Finn, R.D., Fraser, C.M., Gilbert, J.A., Hallam, S.J., Hugenholtz, P., Ioannidis, J.P.A., Jansson, J.K., Kim, J.F., Klenk, H.P., Klotz, M.G., Knight, R., Konstantinidis, K.T., Kyrpides, N.C., Mason, C.E., McHardy, A.C., Meyer, F., Ouzounis, C.A., Patrinos, A.A.N., Podar, M., Pollard, K.S., Ravel, J., Muñoz, A.R., Roberts, R.J., Rosselló-Móra, R., Sansone, S.A., Schloss, P.D., Schriml, L.M., Setubal, J.C., Sorek, R., Stevens, R.L., Tiedje, J.M., Turjanski, A., Tyson, G.W., Ussery, D.W., Weinstock, G.M., White, O., Whitman, W.B., Xenarios, I. Toward unrestricted use of public genomic data. Science. 2019 Jan 25;363(6425):350-352.

Tamarelle, J., Thiébaut, A.C.M., de Barbeyrac, B., Bébéar, C., Ravel, J., Delarocque-Astagneau, E. The vaginal microbiota and its association with human papillomavirus, Chlamydia trachomatis, Neisseria gonorrhoeae and Mycoplasma genitalium infections: a systematic review and meta-analysis. Clin Microbiol Infect. 2019 Jan;25 (1):35-47.

Platz, E.A., Liu, C.M., Michaud, D.S., Mueller, N.T., Ravel, J. The Microbiome and Men's Health. Clin Chem. 2019 Jan;65(1):28-35.

C von Rosenvinge, E., Palumbo, F., Ravel, J., Rowthorn, V., Hoffmann, D. The authors reply. Gut Microbes. 2019;10(2):113-114. PMC6546337.

Tam, J., Hamza, T., Ma, B., Chen, K., Beilhartz, G.L., Ravel, J., Feng, H., Melnyk, R.A. Host-targeted niclosamide inhibits C. difficile virulence and prevents disease in mice without disrupting the gut microbiota. Nat Commun. 2018 Dec 7;9 (1):5233. PMC6286312.

Tamarelle, J., de Barbeyrac, B., Le, Hen. I, Thiébaut, A., Bébéar, C., Ravel, J., Delarocque-Astagneau, E. Vaginal microbiota composition and association with prevalent Chlamydia trachomatis infection: a cross-sectional study of young women attending a STI clinic in France. Sex Transm Infect. 2018 Dec;94(8):616-618.

Ma, B., McComb, E., Gajer, P., Yang, H., Humphrys, M., Okogbule-Wonodi, A.C., Fasano, A., Ravel, J., Viscardi, R.M. Microbial Biomarkers of Intestinal Barrier Maturation in Preterm Infants. Front Microbiol. 2018 Nov 14;9:2755. PMC6246636.

Brotman, R.M., Shardell, M.D., Gajer, P., Fadrosh, D., Chang, K., Silver, M.I., Viscidi, R.P., Burke, A.E., Ravel, J., Gravitt, P.E. Association between the vaginal microbiota, menopause status, and signs of vulvovaginal atrophy. Menopause. 2018 Nov;25 (11):1321-1330.

Cannon, M.V., Bogale, H., Rutt, L., Humphrys, M., Korpe, P., Duggal, P., Ravel, J., Serre, D. A high-throughput sequencing assay to comprehensively detect and characterize unicellular eukaryotes and helminths from biological and environmental samples. Microbiome. 2018 Oct 29;6 (1):195. PMC6206884.

Dausset, C., Patrier, S., Gajer, P., Thoral, C., Lenglet, Y., Cardot, J.M., Judlin, P., Ravel, J., Nivoliez, A. Comparative phase I randomized open-label pilot clinical trial of Gynophilus® (Lcr regenerans®) immediate release capsules versus slow release muco-adhesive tablets. Eur J Clin Microbiol Infect Dis. 2018 Oct;37(10):1869-1880. PMC6154122.

Joag, V., Obila, O., Gajer, P., Scott, M.C., Dizzell, S., Humphrys, M., Shahabi, K., Huibner, S., Shannon, B., Tharao, W., Mureithi, M., Oyugi, J., Kimani, J., Kaushic, C., Ravel, J., Anzala, O., Kaul, R. Impact of Standard Bacterial Vaginosis Treatment on the Genital Microbiota, Immune Milieu, and Ex Vivo Human Immunodeficiency Virus Susceptibility. Clin Infect Dis. 2018 Sep 12. PMC6495022.

Schroeder, H.A., Nunn, K.L., Schaefer, A., Henry, C.E., Lam, F., Pauly, M.H., Whaley, K.J., Zeitlin, L., Humphrys, M.S., Ravel, J., Lai, S.K. Herpes simplex virus-binding IgG traps HSV in human cervicovaginal mucus across the menstrual cycle and diverse vaginal microbial composition. Mucosal Immunol. 2018 Sep;11(5):1477-1486 PMC6485947.

Tyssen, D., Wang, Y.Y., Hayward, J.A., Agius, P.A., DeLong, K., Aldunate, M., Ravel, J., Moench, T.R., Cone, R.A., Tachedjian, G. Anti-HIV-1 Activity of Lactic Acid in Human Cervicovaginal Fluid. mSphere. 2018 Jul 5;3(4). PMC6034077.

Robb, F.T., Techtmann, S.M. Life on the fringe: microbial adaptation to growth on carbon monoxide. 2018 Dec 27;7 PMC6317499

Techtmann, S.M., Colman, A.S., Murphy, M.B., Schackwitz, W.S., Goodwin, L.A., Robb, F.T. Corrigendum: Regulation of multiple carbon monoxide consumption pathways in anaerobic bacteria. Front Microbiol. 2018 Jul 5;9:1016. PMC6041983

Shirey, K.A., Sunday, M.E., Lai, W., Patel, M., Blanco, J.C.G., Cuttitita, F., Vogel, S.N. Novel Role of Gastric Releasing Peptide (GRP)-Mediated Signaling in the Host Response to Influenza Infection. Mucosal Immunology. 2019 Jan;12(1):223-231. PMC6301097

Shirey KA, Perkins DJ, Lai W, Blanco JCG, Vogel SN. The effect of Eritoran and the role of IFN-b on secondary bacterial infections following primary influenza infection. MBio. 2019 May 7; 10(3). Pii:e00810-19. Doi:10.1128/mBio.00810-19 (2019).

Kim, A., Popovici, J., Menard, D., Serre, D. Plasmodium vivax transcriptomes reveal stage-specific chloroquine response and differential regulation of male and female gametocytes. Nature Communications. 2019 Jan 22;10: 371. PMC6342968.

Roesch, C., Popovici, J., Bin, S., Run, V., Kim, S., Ramboarina, S., Rakotomalala, E., Rakotoarison, R.L., Rasoloharimanana, T., Andriamanantena, Z., Kumar, A., Guillotte-Blisnick, M., Huon, C., Serre, D., Chitnis, C.E., Vigan-Womas, I., Menard, D. Genetic diversity in two Plasmodium vivax protein ligands for reticulocyte invasion. PLoS Negl Trop Dis. 2018 Oct 22;12(10):e0006555. PMC6211765.

Bascuñán, P., Niño-Garcia, J.P., Galeano-Castañeda, Y., Serre, D., Correa, M.M. Factors shaping the gut bacterial community assembly in two main Colombian malaria vectors. Microbiome. 2018 Aug 27;6(1):148. PMC6112144.

Popovici, J., Pierce-Friedrich, L., Kim, S., Bin, S., Run, V., Lek, D., Hor Daryl, H.K., Lee Soon-U, L., Cannon, M.V., Serre, D., Menard, D. Recrudescence, reinfection or relapse? A more rigorous framework to assess chloroquine efficacy for vivax malaria. J Infect Dis. 2019 Jan 7;219(2):315-322. PMC6306015.

Popovici, J., Vantaux, A., Primault, L., Samreth, R., Piv, E.P., Bin, S., Kim, S., Lek, D., Serre, D., Menard, D. Therapeutic and Transmission-Blocking Efficacy of Dihydroartemisinin-Piperaquine and Chloroquine against Plasmodium vivax Malaria, Cambodia. Emerg Infect Dis. 2018 Aug;24(8):1516-1519. PMC6056113.

Ouattara, A., Tran, T.M., Doumbo, S., Matthew, A., Agrawal, S., Niangaly, A., Nelson-Owens, S., Doumtabé, D., Tolo, Y., Ongoiba, A., Takala-Harrison, S., Traoré, B., Silva, J.C., Crompton, P.D., Doumbo, O.K., Plowe, C.V. Extent and Dynamics of Polymorphism in the Malaria Vaccine Candidate Plasmodium falciparum Reticulocyte-Binding Protein Homologue-5 in Kalifabougou, Mali. Am J Trop Med Hyg. 2018 Jul;99 (1):43-50. PMC6085788

Knowles, D.P., Kappmeyer, L.S., Haney, D., Herndon, D.R., Fry, L.M., Munro, J.B., Sears, K., Ueti, M.W., Wise, L.N., Silva, M., Schneider, D.A., Grause, J., White, S.N., Tretina, K., Bishop, R.P., Odongo, D.O., Pelzel-McCluskey, A.M., Scoles, G.A., Mealey, R.H., Silva, J.C. Discovery of a novel species, Theileria haneyi n. sp., infective to equids, highlights exceptional genomic diversity within the genus Theileria: implications for apicomplexan parasite surveillance. Int J Parasitol. 2018 Aug;48(9-10):679-690.

Mendes, A.M., Machado, M., Gonçalves-Rosa, N., Reuling, I.J., Foquet, L., Marques, C., Salman, A.M., Yang, A.S.P., Moser, K.A., Dwivedi, A., Hermsen, C.C., Jiménez-Díaz,

PUBLICATIONS

B., Viera, S., Santos, J.M., Albuquerque, I., Bhatia, S.N., Bial, J., Angulo-Barturen, I., Silva, J.C., Leroux-Roels, G., Janse, C.J., Khan, S.M., Mota, M.M., Sauerwein, R.W., Prudêncio, M. A Plasmodium berghei sporozoite-based vaccination platform against human malaria. NPJ Vaccines. 2018 Aug 24;3:33. PMC6109154

Tonui, T., Corredor-Moreno, P., Kanduma, E., Njuguna, J., Njahira, M.N., Nyanjom, S.G., Silva, J.C., Djikeng, A., Pelle, R. Transcriptomics reveal potential vaccine antigens and a drastic increase of upregulated genes during Theileria parva development from arthropod to bovine infective stages. PLoS One. 2018 Oct 10;13 (10):e0204047. PMC6179218

Shetty, A.C., Jacob, C.G., Huang, F., Li, Y., Agrawal, S., Saunders, D.L., Lon, C., Fukuda, M.M., Ringwald, P., Ashley, E.A., Han, K.T., Hlaing, T.M., Nyunt, M.M., Silva, J.C., Stewart, K.E., Plowe, C.V., O'Connor, T.D., Takala-Harrison, S. Genomic structure and diversity of Plasmodium falciparum in Southeast Asia reveal recent parasite migration patterns. Nat Commun. 2019 Jun 17;10 (1):2665. PMC6572796

Rosenberg, K.M., Singh NJ. Mouse T cells express a neurotransmitter-receptor signature that is quantitatively modulated in a subset- and activation-dependent manner. Brain Behav Immun. 2019 Aug;80:275-285. PMC6660347.

Reiser, J., Sadashivaiah, K., Furusawa, A., Banerjee, A., Singh, N.J. Eomesodermin driven IL-10 production in effector CD8+ T cells promotes a memory phenotype. Cell Immunol. 2019 Jan;335:93-102. PMC6449173.

Murphy, T.F., Brauer, A.L., Pettigrew, M.M., LaFontaine, E.R., Tettelin, H. Persistence of Moraxella catarrhalis in chronic obstructive pulmonary disease and regulation of the Hag/MID adhesin. J. Infect. Dis. 2019 Apr 16;219, 1448-1455. PMC6467191

Zella, D., Curreli, S., Benedetti, F., Krishnan, S., Cocchi, F., Latinovic, O.S., Denaro, F., Romerio, F., Djavani, M., Charurat, M.E., Bryant, J.L., Tettelin, H., Gallo, R.C. Mycoplasma promotes malignant transformation in vivo, and its DnaK, a bacterial chaperone protein, has broad oncogenic properties. Proc. Natl Acad. Sci. USA 2018 Dec 18;115, E12005-E12014. PMC6304983

Campo, J.J., Le, T.Q., Pablo, J.V., Hung, C., Teng, A.A., Tettelin, H., Tate, A., Hanage, W.P., Alderson, M.R., Liang, X., Malley, R., Lipsitch, M., Croucher, N.J. Panproteome-wide analysis of antibody responses to whole cell pneumococcal vaccination. eLife 2018 Dec 28;7 PMC6344088.

Javmen, A., Szmacinski, H., Lakowicz, J.R., Toshchakov, V.Y. Blocking TIR Domain Interactions in TLR9 Signaling. J Immunol. 2018 Aug 1;201(3):995-1006.

Srutova, K., Curik, N., Burda, P., Savvulidi, F., Silvestri, G., Trotta, R., Klamova, H., Pecherkova, P., Sovova, Z., Koblihova, J., Stopka, T., Perrotti, D. and Machova Polakova, K. BCR-ABL1 mediated miR-150 downregulation throught MYC contributed to myeloid differentiation block and resistance in chronic myeloid leukemia. Haematologica. 2018 Dec. 103(12): 2016–2025, 2018.

Lee, Y.S., Davila, E., Zhang, T., Milmoe, H.P., Vogel, S.N., Bromberg, J.S., Scalea, J.R. Myeloid-derived suppressor cells are bound and inhibited by anti-thymocyte globulin. Innate Immun. 2019 Jan;25(1):46-59

Banks, D.A., Ahlbrand, S.E., Hughitt, V.K., Shah, S., Vogel, S.N., El-Sayed, N.M., Briken, V. Mycobacterium tuberculosis inhibits autocrine type I interferon signaling to increase intracellular survival. J. Immunol. 202: 2348-2359 (2019). PMC6456408

Bates, J.P., Derakhshandeh, R., Jones, L., Webb, T.J. Mechanisms of immune evasion in breast cancer. BMC Cancer. 2018 May 11;18 (1):556. PMC5948714

Shissler, S.C., Webb, T.J. The Ins and Outs of Type I NKT Cell Development: An Examination of Cell Intrinsic and Extrinsic Effects. Mol. Immunol 2019 Jan;105: 116-130. Pmc6331266

Webb, T.J., Weinmann, A.S. Defining Barriers that Impede Choices. Immunity. 2019 Mar 19;50(3):542-544.

Humeniuk, P., Geiselhart, S., Battin, C., Webb, T., Steinberger, P., Paster, W., Hoffmann-Sommergrsuber, K. Generation of a Jurkat-based fluorescent reporter cell line to evaluate lipid antigen interaction with the human iNKT cell receptor. Sci Rep. 2019 May 15;9(1):7426. PMC6520406

IN PRESS

Wang, W., Cao, X. β-adrenergic signaling in tumor immunology and immunotherapy. Critical Reviews in Immunology. [In Press]

Scanlon, K.M., Skerry, C., Carbonetti, N.H. Role of major toxin virulence factors in pertussis infection and disease pathogenesis. In Pertussis Infection and Vaccines, eds. Fedele, G and Ausiello, C. Springer. [In press]

Deiss, T.C., Breaux, B., Ott, J.A., Daniel, R.A., Chen, P.L., Castro, C.D., Ohta, Y., Flajnik, M.F., Criscitiello, M.F. Ancient Use of Ig Variable Domains Contributes Significantly to the TCRδ Repertoire. J Immunol. [In press]

Richard, K., Vogel, S.N., Perkins, D.J. Quantitation of TLR4 Internalization in Response to LPS in Thioglycollate Elicited Peritoneal mouse Macrophages by Flow Cytometry. [In Press]

Chakraborty, S., Randall, A., Vickers, T.J., Molina, D., Harro, C.D., DeNearing, B., Brubaker, J., Sack, D.A., Bourgeois, J.L., Felgner, P.L., Liang, X., Mani, S., Wenzel, H., Townsend, R.R., Gilmore, P.E., Darsley, M.J., Rasko, D.A., Fleckenstein, J.A. Molecular and immunological characterization of a live-attenuated ETEC vaccine. NPJ Vaccine. [In Press]

Rasko, D.A., Del Canto, F., Luo, Q., Fleckenstein, J.M., Vidal, R., Hazen, T.H. Comparative genomic analysis and molecular examination of the diversity of enterotoxigenic Escherichia coli isolates from Chile. PLoS Neglected Tropical Diseases. [In Press]

Hazen, T.H., Rasko, D.A. Complete genome of the atypical enteropathogenic Escherichia coli archetype isolate E110019 highlights a role of plasmids in dissemination of the type III secreted effector EspT. Infection and Immunity. [In Press]

Small, S.T., Labbé, F., Coulibaly, Y.I., Nutman, T.B., King, C.L., Serre, D., Zimmerman, P.A. Human Migration and the Spread of the Nematode Parasite Wuchereria bancrofti. Mol Biol Evol [In Press]

Shirey, K.A., Lai, W., Brown, L.J., Blanco, J.C.G., Wang, Y., Beadenkopf, R., Vogel, S.N., Synder, G.A. Select targeting of intracellular Toll-Interleukin-1 Receptor resistance domains for protection against influenza-induced disease. Innate Immunity. [In Press]

SUBMITTED

Driscoll, T.P., Verhoeve, V.I., Gillespie, J.J., Johnston, J.S., Guillotte, M.L., Rennoll-Bankert, K.E., Rahman, M.S., Hagen, D., Elsik, C.G., Macaluso, K.R., Azad, A.F. Cat fleas in flux: Rampant gene duplication, genome size plasticity, and paradoxical Wolbachia infection. [Submitted].

Brown, S.E., Schwartz, J.A., Robinson, C.K., O'Hanlon, D.E., Bradford, L.L., He, X., Mark, K.S., Bruno, V.M., Ravel, J., Brotman, R.M. "The vaginal microbiota and behavioral factors associated with genital Candida albicans detection in reproductive-age women". [Accepted pending revision]

Break, T.J., Oikonomou, V., Dutzan, N., Desai, J.V., Harrison, O.J., Alejo, J., Pittaluga, S., Lee, C.R., Swamydas, M., Hoffman, K.W., Wild, T., Bruno, V.M., Rosen, L.B., Lwin, W., Reneteria, A., Pontejo, S.M., Shannon, J.P., Myles, I.A., Olbrich, P., Ferre, E.M.N., Schmitt, M., Martin, D., Swidergall, M., Solis, N.V., Filler, S.G., Notarangelo, L.D., Serreze, D.V., Matsumoto, M., Hickman, H., Murphy, P.M., Anderson, M.S., Lim, J.K., Holland, S.M., Belkaid, Y., Moutsopoulos, N.M., Lionakis, M.S. "Aberrant type I immunity drives mucosal infection susceptibility". [Submitted]

Ardanuy, J.G., Skerry, C., Scanlon, K.M., Fuchs, S.Y., Carbonetti, N.H. Age-dependent effects of type I and type III interferons in the pathogenesis of Bordetella pertussis infection and disease. [Submitted]

Ernst, K., Mittler, A., Winkelmann, V., Eberhardt, N., Anastasia, A., Sonnabend, M., Lochbaum, R., Wirsching, J., Skerry, C., Carbonetti, N.H., Frick, M., Barth, H. Host cell chaperones and peptidyl prolyl cis/trans isomerases are required for the uptake of Bordetella pertussis toxin into mammalian cells. [Submitted]

Scalia, F., Marino Gammazza, A., Conway de Macario, E., Macario, A.J.L., Cappello, F. Myelin pathology: involvement of molecular chaperones and the promise of chaperonotherapy. [Submitted]

Caruso Bavisotto, C., Cipolla, C., Graceffa, G., Barone, R., Bucchieri, F., Cabibi, D., Marino Gammazza, A., Pitruzzella, A., Porcasi, R., Tomasello, G., Conway de Macario, E., Macario, A.J.L., Cappello, F., Rappa, F. Quantitative patterns of molecular chaperones distinguish papillary carcinoma from normal and goiter thyroid tissues and suggest a potential use for diagnosis and patient follow up. [Submitted]

Macario, A.J.L., Conway de Macario, E. Molecular mechanisms in chaperonopathies: torches illuminating the path toward understanding the histopathological lesions. [Submitted]

Dooley, H. Generation of VNAR libraries from immunized sharks and selection of target-specific clones. Immune Receptors: Methods and Protocols, Second Edition. [Submitted]

Tan, M., Redmond, A.K., Dooley H., Nozu, R., Sato, K., Kuraku, S., Koren. S., Phillippy, A.M., Dove, A.D.M. & Reid, T.D. The whale shark genome and patterns of vertebrate gene family evolution. https://www.biorxiv.org/content/10.1101/685743v1. [Submitted]

Shetty, A., Chung, M., Mattick, J., Mahurkar, A., Filler, S., Fraser, C.M., Rasko, D.A., Bruno, V.M., Dunning Hotopp, J.C. The Most Cost Effective, Experimentally Robust Differential Expression Analysis for Human/Mammalian, Pathogen, and Dual-Species Transcriptomics. Microbial Genomics [In Revision]

Chung, M., Adkins, R.S., Shetty, A.C., Sadzewicz, L., Tallon, L.J., Fraser, C.M., Rasko, D.A., Mahurkar, A., Dunning Hotopp, J.C. FADU: A Feature Counting Tool for Prokaryotic RNA-Seq Analysis. [In Revision]

Foster, J. F., Grote, A., Mattick, J., Tracey, A., Tsai, Y.C., Brookes, K., Chung, M., Cotton, J.A., Clark, T.A., Geber, A., Holroyd, N., Korlach, J., Libro, S., Lomax, J., Lustigman, S., Michalski, M.L., Paulini, P., Rogers, M.B., Twaddle, A., Berriman, M., Dunning Hotopp, J.C., Ghedin, E. Genomics of Sex Chromosome Evolution in Parasitic Nematodes of Humans. Nature Communications. [Submitted]

Chung, M., Teigen, L., Libro, S., Bromley, R.E., Kumar, N., Sadzewicz, L., Tallon, L.J., Foster, J.M., Michalski, M.L., Dunning Hotopp, J.C. Drug repurposing of bromodomain inhibitors as potential novel therapeutics for lymphatic filariasis guided by multi-species transcriptomics. [Resubmitted]

Dunning Hotopp, J. C., Matsumura, J., Bromley, R., Riley, D.R., Agrawal, S., Sparklin, B., Mattick, J., Crabtree, J., Mahurkar, A. TwinBLAST: When Two Is Better Than One. Microbial Resource announcement. [In Revision]

Kundu, N., Ma, X., Brox, R., Fan, X., Kochel, T., Reader, J., Tschammer, N., Fulton, A. The Chemokine Receptor CXCR3 Isoform B Drives Breast Cancer Stem Cells. Breast Cancer: Basic and Clinical Research. [Accepted]

Brown, R.A, Voit, A., Srikanth, M.P., Thayer, J.A., Kingsbury, T.J., Jacobson, M.A., Lipinski, M.M., Feldman, R.A., Awad, O. mTOR hyperactivity mediates lysosomal dysfunction in Gaucher's disease iPSC-neuronal cells. [In Revision]

Feng, C., Vasta, G.R. Purification and Biochemical Characterization of Selected F-Type Lectins. [Submitted]

PUBLICATIONS

Vasta, G.R., Feng, C. F-type lectins: Structure, Function, and Evolution. [Submitted]

Ohta, Y., Kasahara, M., O'Connor, T., and Flajnik, M.F. Emergence of the MHC and CD1 and genome-wide duplications early in vertebrate history. J. Immunol. [In Revision]

Kulcsar, K., Coleman, C.M., Beck, S., Frieman, M. Comorbid diabetes results in immune dysregulation and enhanced disease severity following MERS-CoV infection. [Under review]

Johns, R. A., Nakahara, M., Skinner, J., Tamosiuniene, R., Nicolls, M. R., Keegan, A. D., and Yamaji-Kegan, K., Dysregulated IRS2 in pulmonary hypertension and its anti-inflammatory role in lung vasculature under hypoxic conditions. [Under revision]

Turri, V., Ruggeri, F., Schoelz, J.E., Salvato, M.S., Ravaioli, S., Sarnelli, A., Piccinini, F., Latinovic, O.S., Cauliflower mosaic virus proteins in human glioblastoma cells: Cytoplasmic and nuclear expression. Science Reports. [Submitted]

Affram, Y., Zapata, J., Tolbert, W., Zhou, W., Iglesias-Ussel, M., Pazgier, M., Ray, K., Latinovic, O.S., Romerio, F. The HIV-1 antisense protein ASP is an integral protein of the viral envelope. Journal of Virology. [Submitted]

Oliva Chávez, A.S., Wang, X., Archer, N., Hammond, H.L., McClure Carroll, E.E., Shaw, D.K., Buskirk, A.D., Ford, S.L., Morozova, K., Clement, C.C., Lawres, .L., O'Neal, A.J., Ben Mamoun, C., Mason, K.L., Hobbs, B.E., Scoles, G.A., Barry, E.M., Sonenshine, D.E., Pal, U., Valenzuela, J.G., Sztein, M.B., Pasetti, M.F., Levin, M.L., Kotsyfakis, M., Jay, S.M., Miller, L., Santambrogio, L., Pedra, J.H.F. Tick nanovesicles determine virulence during vector-borne microbial transmission. [Submitted]

Richard, K., Perkins, D.J., Shirey, K.A., Lai, W., Harberts, E.M., Song, Y., Mahurkar, A., Carter-Cooper, B., Lapidus, R., Hawkins, L.D., Ernst, R.K., Vogel, S.N. Discrete transcriptional programs induced by attenuated LPS-based TLR4 adjuvants: A reinterpretation of "TRIF bias". [Submitted]

Saffarian, A., Mulet, C., Regnault, B., Amiot, A., Tran-Van-Nhieu, J., Ravel, J., Sobhani, I., Sansonetti, P.J., Pédron, T. Crypt- and Mucosa-Associated Core Microbiotas in Humans and Their Alteration in Colon Cancer Patients. MBio. [Accepted]

Ma, B., France, M., Crabtree, J., Holm, J.B., Humphrys, M.S., Brotman, B., Ravel, J. VIRGO, a comprehensive non-redundant gene catalog, reveals extensive within community intraspecies diversity in the human vagina. Nature Communications. [Under review]

Edwards, V.L., Smith, S.B., McComb, E.J., Tamarelle, J., Ma, B., Humphrys, M.S., Gajer, P., Gwilliam, K., Schaefer, A.M., Lai, S.K., Terplan, M., Mark, K.S., Brotman, R.M., Forney, L.J., Bavoil, P.M., Ravel, J. The cervicovaginal microbiota-host interaction modulates Chlamydia trachomatis infection. mBio. [Accepted]

Tamarelle, J., Ma, B., Gajer, P., Terplan, M., Mark, K.S., Thiebaut, A.C.M., Forney, J., Brotman, R.M., Delarocque-Astagneau, E., Bavoil, P., Ravel, J. Non-optimal vaginal microbiota after azithromycin treatment for Chlamydia trachomatis infection. Journal of Infectious Diseases. [Under revision]

Liang, R., Lau, M., Baars, O., Robb, F.T., Onstott, T. Viability and aspartic acid racemization kinetics of Geobacillus stearothermophilus spores. FEMS Microbial Ecology. [Submitted]

Sa, J.M., Cannon, M.V., Caleon, R.L., Wellems, T.E., Serre, D. Single-cell transcriptomes of Plasmodium vivax parasites reveal extensive but continuous changes in gene expression during their intraerythrocytic cycle [Submitted]

Doran, S.J., Henry, R.J., Shirey, K.A., Barrett, J.P., Ritzel, R.M., Lai, W., Blanco, J.C., Faden, A.I., Vogel, S.N., Loane, D.J. Traumatic brain injury alters monocyte function in male mice and increases mortality during secondary Streptococcus pneumoniae lung infection. Critical Care Medicine. [Submitted]

Silva, M.C., Chibucos, M., Munro, J.B., Su, Q., Daugherty, S., Coelho, M.M., Silva, J.C. Characterization and adaptive evolution of olfactory receptor genes in Cory's shearwater: evidence for a molecular basis of smell in procellariiform seabirds. Scientific Reports. [In Revision]

Schindler, T., Deal, A.C., Fink, M., Guirou, E., Mwakasungula, S.M., Mihayo, M.G., Jongo, S.A., Chaki, P.P., Abdullah, S., Bieri, J.R., Moser, K.A., Silva, J.C., Hoffman, S.L., Gamboa, D., Tanner, M., Daubenberger, A. A multiplex qPCR approach for detection of pfhrp2 and pfhrp3 gene deletions in multiple strain infections of Plasmodium falciparum. Scientific Reports. [Submitted]

Ouattara, A., Niangaly, A., Adams, M., Coulibaly, D., Kone, A.K., Traore, K., Laurens, M.B., Tolo, Y., Kouriba, B., Diallo, D.A., Doumbo, O.K., Plowe, C.V., Thera, M.A., Laufer, M.K., Takala-Harrison, S., Silva, J.C. Epitope-based sieve analysis of Plasmodium falciparum sequences to assess if FMP2.1/AS02A is consistent with differential vaccine efficacy against immunologically relevant AMA1 variants. Vaccine. [Submitted]

Tretina, K., Haidar, M., Chaussepied, M., Fry, L., Knowles, D.P., Nene, V.M., Ginsberg, D., Daubenberger, C.A., Bishop, R.P., Langsley, G., Silva, J.C. Theileria parasites subvert Retinoblastoma-1/E2F signaling to stimulate leukocyte proliferation. Scientific Reports. [Submitted]

Moser, K.A., Drabek, E.F., Dwivedi, A., Crabtree, J., Stucke, E., Dara, A., Shah, Z., Adams, M., Li, T., Rodrigues, P., Korsen, S., Phillippy, A., Ouattara, A., Lyke, K., Sadzewicz, L., Tallon, L., Ferreira, M.U., Laufer, M., Travassos, M., Takala-Harrison, S., Fraser, C.M., Sim, B.K.L., Hoffman, S.L., Plowe, C.V., Silva, J.C. Plasmodium falciparum strains used in whole organism malaria vaccines and controlled human malaria infections differ in genome sequence, structure, immunological potential. Genome Medicine. [Submitted]

Kilian, M., Tettelin, H. Identification of virulence-associated properties by comparative genome analysis of Streptococcus pneumoniae, S. pseudopneumoniae, S. mitis, three S. oralis subspecies, and S. infantis. mBio. [Submitted]

D'Mello, A., Ahearn, C.P., Murphy, T.F., Tettelin, H. ReVac: an integrated large-scale reverse vaccinology pipeline. BMC Genomics. [Submitted]

Salerno-Gonçalves, R., Tettelin, H., Luo, D., Guo, Q., De Groot, A.S., Sztein, M.B. Differential functional patterns of the memory CD4+ and CD8+ T-cells from volunteers immunized with Ty21a typhoid vaccine detected by a recombinant Escherichia coli expressing system. Vaccine. [Submitted]

Benedetti, F., Krishnan, S., Cocchi, F., Tettelin, H., Gallo, R.C., Zella, D., Curreli, S. Proteome analysis of Mycoplasma fermentans cultured under aerobic and anaerobic conditions. Journal of Translational Medicine. [Submitted]

Javmen, A., Toshchakov, V.Y. Targeting the TLR signalosome with TIR domain-derived cell-permeable decoy peptides: the current state and perspectives. Innate Immunity [Accepted]

Javmen, A., Szmacinski, H., Lakowicz, J.R., Toshchakov, V.Y. Targeting the TLR7 signalosome assembly. Journal of Leukocyte Biology [In Revision]

Silvestri, G., Trotta, R. Stramucci, L., Ellis, J., Harb, J., Neviani, P., Wang, S., Eisfeld, A.K., Zhang, B., Walker, C., Zhang, B., Srutova, K., Gambacorti-Passerini, C., Pineda, G., Jamieson, CHM., Calabretta, B., Stagno, F., Vigneri, P., Nteliopoulos, G., May, P., Reid, A., Garzon, R., Roy, D.C., Moutuou, M.M., Guimond, M., Hokland, P., Deininger, M., Fitzgerald, G., Harman, C., Dazzi, F., Milojkovic, D., Apperley, J.F., Marcucci, G., Qi, J., Machova-Polakova, K., Zou, Y., Fan, X., Baer, M. R., Calabretta, B. and Perrotti, D. The14q32.31 DLK1-DIO3 MIR300 tumor suppressor promotes leukemogenesis by inducing cancer stem cell quiescence and inhibiting NK cell anti-cancer immunity. bioRxiv. [Pre-Print]

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