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MicrOScoop

The Newsletter of the UMB Microbiology & Immunology Community

February 2017 Issue...

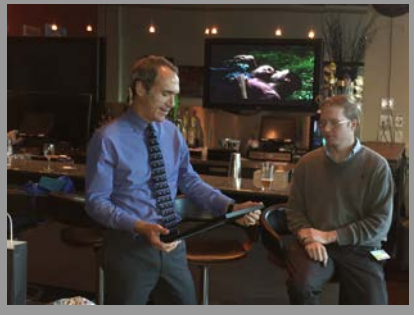
...we will be recapping several of the important events in the MMI community that occurred in 2016!

- Farewell Dr. Donnenberg!
- Annual Welcome Picnic
- ASM Boston "Maryland Michigan Party"
- Graduated Student Bios and Advice
- Vaxchora Vaccine
- Holiday RNE
- Faculty Promotions in the Department of Microbiology and Immunology
- New Student Bios
- Announcements!

Farewell Dr. Donnenberg!

By Stephanie Lehman

Congratulations to Dr. Michael Donnenberg who has accepted a position as Associate Dean for Research at the Virginia Commonwealth University (VCU) School of Medicine!



Dr. Donnenberg received his M.D. from Columbia Univserity and, after finishing his residency, completed one fellowship in infectious disease at Tufts and then he did a second research fellowship in Dr. Kaper's laboratory at the Center for Vaccine Development in the UMSOM.

He then became an Assistant Professor at UMB and stayed with us for 16 years, ultimately becoming a tenured professor and director of the MD-PhD program. He was the recipient of several awards, including numerous Host Defenses and Infectious Diseases Teaching Commendations in Bacteriology and Virology. He also served on many MMI committees and taught in several MMI courses. He will be missed, but we all wish him much success at VCU!

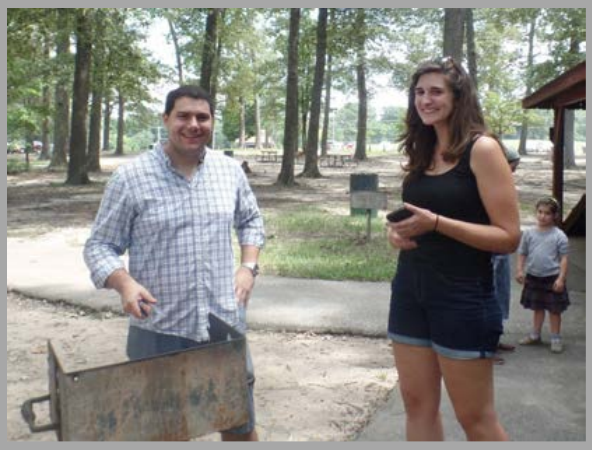
Annual Student Welcome Picnic

This year's 16th annual picnic welcomed the incoming students and new faculty into our community.

Friday, August 19th was the perfect day for a picnic. Rain from the night before reduced the August heat to an enjoyable temperature. The skies were clear blue with a few impeccably-formed, fluffy clouds. Every year the Departments of Microbiology & Immunology and Microbial Pathogenesis host a picnic to welcome the incoming students and introduce them to the department.

This year's picnic had a few hiccups. Only a few weeks before the picnic, severe storms flooded Patapsco State Park, preventing us from returning. Fortunately, the department rallied and found a backup location at Lake Waterford Park's Blue Jay Pavilion. The park offered a beautiful lake, a couple short trails, and an amazing playground. While some chatted around the tables, students and faculty alike enjoyed games of corn hole and frisbee.

As is tradition, burgers and hots dogs were provided by the department and sides and desserts were contributed pot luck style. In the end, a smorgasbord of good food and great company was enjoyed by all.



Faculty Promotions in the Department of Microbiology and Immunology

Faculty promotions that went into effect on July 1st were announced in early September. At the Research Networking Event on September 19th, department members gathered to celebrate, including a speech from Dr. Jim Kaper, M&I department chair, discussing the pride he feels when faculty progress in their careers. Promoted faculty members are listed below.

Julie Dunning Hotopp, Assoc Prof M & I - awarded tenure
Tonya Webb, promoted to Assoc Prof M & I
Joao Pedra, promoted to Assoc Prof M & I
Dave Rasko, promoted to Professor M & I
Dan Schulze, promoted to Professor M & I
Mark Shirtliff, promoted to Professor MP (primary) and Professor M & I (secondary)
Sergei Atamas, promoted to Professor of Medicine (primary) and M & I (secondary)

Eric Sundberg, promoted to Professor of Medicine (primary) and M & I (secondary)

ASM Boston 2016:

"The Maryland-Michigan Party"

By Stephanie Lehman

The story:

"It all started in the 80's. Harry Mobley and Jim Kaper shared a hotel room at the meeting of the American Society for Microbiology and invited a few friends over for beers iced down in their bathtub. This gradually became a tradition, even when Dr. Mobley moved to the University of Michigan. It was soon known as "The Maryland-Michigan Party."

The number of friends invited grew and grew, until finally they had to book a block of rooms and a reception hall at a hotel for everyone to be together." This year's ASM Maryland-Michigan Party was held at Boston's famous McGreevy's sports bar, home to America's first baseball museum and home of the Dropkick Murphys. Once again, there was a large crowd from Michigan and Maryland, as well as several universities across the country.

UMB's Phil Balzano, Stephanie Lehman, Eileen Barry, and Greg Snyder were there, as well as several former UMB trainees.Other universities represented included Northwestern, Harvard, University of North Carolina, University of Washington, University of North Carolina Chapel Hill and Charlotte, Michigan State, University of Illinois, University of Texas Medical Branch.

The Maryland-Michigan party was, as always, the best way to close out such a great conference! See you at the next Maryland-Michigan party in New Orleans in 2017!

Graduated Students

By Kyle Tretina

Grant Jones: My thesis was about Dinoflagellates. I was co-mentored by Rosemary Jagus, UMCES and Allen Place, UMCES. It was sort of weird. I think I'm one of the few to have not only have two advisors, but two completely outside the UMB faculty. I am now an IRTA Postdoc Fellow in NIDDK at the NIH in Bethesda. I'm being advised by Dr. Nicholas Guydosh who just started his lab there this year. I'm currently working on different ways ribosome profiling can be used to study both translation and aspects of immunity including the targets of RNases and production of DRiPs. I'm proud that I stuck with it.

I had a rough time getting through my classes and the comprehensive exam. On top of that, I had to change labs and entire research areas. In the end it worked out great, but it took some courage to get through a few blows to my self esteem along the way. I look back at my first year in the program in terror and with reverence. It was so much work going through the core course and those first MMI classes, but I met a lot of people who shared my love of science and it felt like I belonged. I also joined the GSA and had a lot of fun planning events for students and interacting with university leadership. That type of experience is valuable and you do actually use it later on in life.

My advice is to talk to everyone around you! So often people will come into grad school or in to a new lab and they won't engage with those around them or in other labs or in other research areas. Networking and making connections with people not doing the small slice of science you are working on is enormously helpful. You'll develop a whole network of people to help you when you have a problem. You'll have incite into resources that are available but unutilized. Second, try and expand beyond the typical molecular biology you do in lab. Is there a new technique out there that could make your project novel or test your hypothesis in a new way for your field? If you want to have an edge in the job market, then you need to be well-rounded and eager to learn the latest technology available. Otherwise, it's great you can do a western blot, but so can basically everyone else. Also, never be afraid to walk right up to that big PI at a conference and ask to inteview in their lab. It worked for me!

Jeff Freiberg: My thesis was titled ‘Identification and Characterization of Genes Involved in Biofilm Growth and Antibiotic Tolerance in Streptococcus pyogenes’. I was in the lab of Mark Shirtliff, PhD. I am now in medical school finishing the last two years of training required for my medical degree. I am very proud of how my dissertation project turned out. I am also proud to have won the Kaper Award, and I enjoyed the camaraderie between the students and also with the faculty. The MMI program provides a wonderful community here at UMB. My advice to current students is to take advantage of all the extra opportunities you have as a result of being a part of such a strong graduate program. Whether it is meeting seminar speakers or learning new techniques from other labs, these are the things that will enrich your grad school experience.

Alexandria Reinhart: My thesis was titled ‘Roles of the PrrF and PrrH Small RNAs In Iron Homeostasis and Pathogenesis of Pseudomonas aeruginosa.’ I was in the lab of Dr. Amanda Oglesby-Sherrouse, and am now an ORISE Fellow at Walter Reed Army Institute of Research. My advice to current students would be that "Pride goeth afore a fall." Remember that. Also, remember to volunteer on/off campus - it'll get you out of the lab.

FDA Approves Vaxchora Vaccine for Cholera Invented and Developed at University of Maryland School of Medicine

By Stephanie Lehman

"The good news is that patience and persistence lead to success in the end, allowing good science to prevail for the benefit of those in need." (Herzog C, Successful comeback of the single-dose live oral cholera vaccine CVD 103-HgR, Travel Medicine and Infectious Disease (2016))

After nearly 30 years, a single-dose live oral cholera vaccine developed by the UMSOM Center for Vaccine Development is now being produced in the U.S. and has been licensed by the FDA. Despite its efficacy and excellent demonstrated safety, the live attenuated vaccine encountered a series of setbacks in the early stages of development. The European Commission issued a 7-year moratorium for genetically modified organisms (which included the vaccine); combined with poor results in an efficacy trial due to a 'herd immunity effect,' and several expensive production delays, the market for the cholera vaccine was considered unprofitable.

In 2010, PaxVax obtained exclusive rights to the vaccine, and initiated re-development and production. After a successful human challenge following a single dose, as well as several successful Phase III safety and immunogenicity studies, the vaccine was submitted to the FDA for fast track procedure. Now that a licensure for prophylaxis has been obtained, the next goal is to license the vaccine for intervention during endemic and epidemic outbreaks.

Dr. Levine and Dr. James B. Kaper, PhD, Professor and Chairman of the UM SOM Department of Microbiology and Immunology, and the senior associate dean for academic affairs at UMSOM, co-invented the vaccine at the University of Maryland Medical School Center for Vaccine Development. Vaxchora, is the only approved vaccine in the U.S. for protection against cholera.

Holiday RNE

By Susannah Shissler

On Friday December 16th a magical transformation christened the HSF-2 Atrium as the new Holiday RNE location. This RNE, hosted by the Department of Microbiology & Immunology, the Department of Microbial Pathogenesis, and the Graduate Program in Molecular Microbiology and Immunology, is an annual event that draws faculty, staff, and students en masse to enjoy each other's company and celebrate the successes of the year.

Large tables were set with sparkling centerpieces of Santa's sleigh and reindeer while bar tables were decorated with shiny ornaments. Candy Canes were scattered throughout for those with a sweet tooth and icebreaker games, such as Guess the Christmas Carol and Who's Coming to Dinner, were distributed. Music played pleasantly in the background as revelers gathered. In the buffet line, accompanied by a crackling fire and Christmas music, one could find an overindulgence of food ranging from classic Maryland crab dip and crab cakes to curry and coconut shrimp.

As per annual tradition, dessert was provided in the form of a department wide dessert contest and beverages were supplemented by the cocktail contest (Winners listed below). The afternoon was capped off by the unveiling of the department holiday present, a blue baseball cap emblazoned with the department logo.

Dessert Contest:

1st Abby Corona

2nd Erin McClure

3rd Devon Allison

4th Wendy Lay

Cocktail Contest:

Best Taste: Emily Flowers

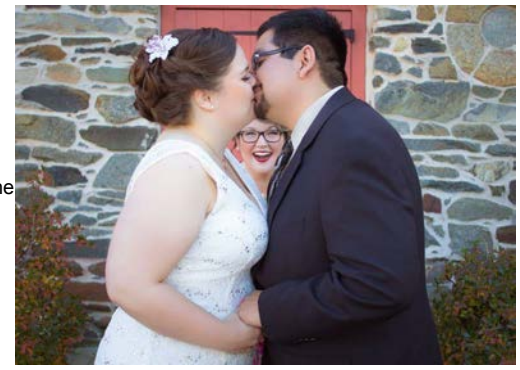
Best Presentation: Dana Shaw

Most Creative: Angel Corona

Who's Coming to Dinner Icebreaker:

Announcements

Happy News



Abby McGillivray and **Angel Corona** were engaged on Valentine's Day 2016 and were married at Jerusalem Mills on November 18th 2016, on a beautiful, sunny, fall Friday afternoon, and honey-mooned in D.C. that weekend. It was a quiet and private ceremony. They also both presented at the American Society for Virology meeting in June 2016.
Katharina Richard of the Vogel lab and her husband Jonathan are the proud parents of Leander A. W. Richard-Mulholland, born on November 30, 2015
Aimee Cunningham from the Barry Lab had a baby
Phillip Balzano of the Barry Lab got married
Stephanie Lehman, a 4th year graduate student in Dr. Abdu Azad's lab, is engaged to be married to Ryan Hannah, a scientific program analyst in Frederick, MD. Stephanie and Ryan met in when they worked at the same company in Fort Detrick, MD. A small wedding is planned for Fall 2017.
Elizabeth Weingartner, a 4th year graduate student in Dr. Amit Golding's lab, is engaged to be married to Cass Sherpherd, a grassroots marketing manager at Road Runner Sports. Elizabeth and Cass met as high school students when they worked at the same wing joint in Cincinnati, Ohio.
Emily Smith (GS-I) was married this past July 23, 2016 to Patrick Smith II

Graduations
Jeffrey Freiberg, Ph.D., Graduate Program in Life Sciences, Molecular Microbiology and Immunology, University of Maryland, Baltimore. Advisor, Mark E. Shirtliff, Ph.D.

Promotions
Mark E. Shirtliff, Ph.D. was promoted in July 2016 to Professor with tenure in the Department of Microbial Pathogenesis, School of Dentistry (primary appointment) and to Professor in the Department of Microbiology and Immunology, School of Medicine (secondary appointment)

Awards
Aimee Cunningham (Barry lab) won the 2016 Maurice R. Hilleman Early-Stage Career Investigator Award, Annual Conference for Vaccine Research, Baltimore, MD
Kurt Piepenbrink from the Sundberg Lab was awarded the GPILS Postdoctoral Scholar of the Year in October 2016

Funding
James B. Kaper, Ph.D., Professor & Chair, Department of Microbiology & Immunology, and Senior Associate Dean for Academic Affairs, received a five-year $6,802,230 Program Project (P01) grant from the National Institute of Allergy and Infectious Diseases (NIAID) for a program project grant entitled "Pathogenesis of E. coli and Shigella infections in human enteroid models". Collaborating SOM investigators on this project include **Eileen Barry, Ph.D**., Professor of Medicine, Microbiology & Immunology, and **Marcela Pasetti**, Ph.D., Professor of Pediatrics, Microbiology & Immunology, both from the Center for Vaccine Development, Institute of Global Health.
Jacques Ravel Ph.D., Professor, Microbiology and Immunology, Associate Director, Genomics, Institute for Genome Sciences, was awarded a five-year, $2,489,438 grant from the National Institute of Nursing Research (NINR) entitled " Elucidating causes of vaginal symptoms using a multi-omics approach."
NIH/NIAID R21 AI117095 "Host-targeted therapeutics for pertussis in infants" 1/1/16 - 12/31/17 PI: **Carbonetti NH**

Patents
"Multivalent vaccine protection from *Staphylococcus aureus* infection". Jeff G. Leid, Janette Harro, and **Mark E. Shirtliff** – US Patent 9,265,850. February 23, 2016

Publications
Allison DL, Willems HME, Jayatilake JAMS, **Bruno VM**, Peters BM, **Shirtliff ME**. (2016) *Candida*-bacteria interactions: Their impact on human disease. *Virulence Mechanisms of Bacterial Pathogens, 5th Edition*, Ch. 5, 103-36.
Allison DL, Willems HME, Jayatilake JAMS, **Bruno VM**, Peters BM, **Shirtliff ME**. (2016) *Candida*-bacteria interactions: Their impact on human disease. *Microbiology Spectrum* 4:VMBF-0030-2016.
Archer NK, Adappa ND, Palmer JN, Cohen NA, Harro JM, **Shirtliff ME**. (2016) IL-17A and IL-17F are critical for antimicrobial peptide production and clearance of *Staphylcoccus aureus* nasal colonization. *Infection and Immunity*, in press.
Blanchette KA, Shenoy AT, Milner II J, Gilley RP, McClure E, Hinojosa CA, Kumar N, Daugherty SC, Tallon LJ, Ott S, King SJ, Ferreira DM, Gordon SB, **Tettelin H**, Orihuela CJ. (2016) Neuraminidase-exposed galactose promotes *Streptococcus pneumoniae* biofilm formation during colonization. *Infection and Immunity* 84:2922-32.
Bradford LL, **Ravel J**. (2016) The vaginal mycobiome: a poorly understood contributor to women's health and diseases. *Virulence*.

Breshears LM, Edwards VL, **Ravel J**, Peterson ML. (2015) *Lactobacillus crispatus* inhibits growth of *Gardnerella vaginalis* and *Neisseria gonorrhoeae* on a porcine vaginal mucosa model. *BMC Microbiology* 15:276.
Carbonetti NH. (2016) *Bordetella pertussis*: New concepts in pathogenesis and treatment. *Current Opinion in Infectious Diseases* 29:287-294.
Carbonetti NH. (2016) Pertussis leukocytosis: mechanisms, clinical relevance and treatment. *Pathogens and Disease* 74:ftw087.
Chmelar, Kotál J, Karim S, Kopacek P, Francischetti I, **Pedra JHF.** (2016) Sialomes and mialomes: a systems biology view of tick interactions. *Trends in Parasitology* 32: 242-54.
Choi SY, Rashed SM, Hasan NA, Alam M, Islam T, Sadique A, Johura F-T, Eppinger M, **Ravel J**, Huq A, Cravioto A, Colwell RR. (2016) Phylogenetic Diversity of *Vibrio cholerae* associated with endemic cholera in Mexico from 1991 to 2008. *mBio* 7:e02160-15.
Cogan NG, Harro J, Stoodley P, **Shirtliff ME**. (2016) Predictive computer models for biofilm detachment properties in *Pseudomonas aeruginosa*. *mBio* 7: e00815-6.
Crits-Christoph A, Gelsinger DR, Ma B, Wierzchos J, **Ravel J**, Davila A, Casero MC, Diruggiero J. (2016) Functional interactions of archaea, bacteria, and viruses in a hypersaline endolithic community**.** *Environmental Microbiology* 18:2064-77.
Crits-Christoph A, Robinson CK, Ma B, **Ravel J**, Wierzchos J, Ascaso C, Artieda O, Souza-Egipsy V, Casero MC, Diruggiero J. (2016) Phylogenetic and functional substrate specificity for endolithic microbial communities in hyper-arid environments. *Frontiers in Microbiology* 7:301.
Cunningham AL, Guentzel MN, Yu JJ, Hung CY, Forsthuber TG, Navara C, Yagita H, Williams I, Klose KE, Eaves-Pyles TD, Arulanandam BP. (2016) M-cells contribute to the entry of an oral vaccine but are not essential for the subsequent induction of protective immunity against *Francisella tularensis*. *Plos One* 11:e0153402.
Freiberg JA, Le Breton Y, Tran BQ, **Scott AJ**, Harro JM, **Ernst RK**, Goo YA, **Mongodin EF**, Goodlett DR, McIver KS, **Shirtliff ME**. (2016) A global analysis and comparison of the transcriptome and proteome of Group A *Streptococcus* biofilms. *mSystems*, in press.
Gillespie JJ, Phan IQH, Scheib H, Subramanian S, Edwards TE, **Lehman SS**, Pitulainen H, **Rahman MS**, **Rennoll-Bankert KE**, Staker BL, Taira S, Stacy R, Myler PJ, **Azad AF**, Pulliainen AT. (2015) Structural insight into how bacteria prevent interference between multiple divergent type IV secretion systems. *mBio* 6:e01867-15.
Gillespie JJ, Phan IQH, Driscoll TP, **Guillotte ML**, **Lehman SS**, **Rennoll-Bankert KE**, Subramanian S, Beier-Sexton M, Myler PJ**, Rahman MS, Azad AF**. (2016) Intracellular disassembly and activity of pertussis toxin require interaction with ATP. *Pathogens and Disease* 74:ftw058.
Hooven TA, Catomeris AJ, Akabas LH, Randis TM, Maskell DJ, Peters SE, Ott S, Santana-Cruz I, Tallon LJ, **Tettelin H**, Ratner AJ. (2016) The essential genome of *Streptococcus agalactiae*. *BMC Genomics* 17:406.
Ixodes scapularis International Consortium (including **Pedra JHF**). (2016) Genomic insights into the parasitic vector of Lyme disease, *Ixodes scapularis*. *Nature Communications* 7:10507.
Kaczanowska S, Davila E. (2015). Ameliorating the tumor microenvironment for anti-tumor responses through TLR5 ligand-secreting T cells. *Oncoimmunology* 5(4):e1076609.
Kim EY, Durai M, Mia Y, Kim HR, **Moudgil KD**. (2016) Modulation of adjuvant arthritis by cellular and humoral immunity to Hsp65. *Frontiers in Immunology* 7: 203.
Liu C, **Richard K**, Wiggins M, Zhu X, Conrad DH, Song W. (2016) CD23 can negatively regulate B-cell receptor signaling. *Scientific Reports* 6:25629.
Liu J, Li L, Peters BM, Li B, Deng Y, Xu Z, **Shirtliff ME**. (2016) Draft genome sequence and annotation of *Lactobacillus acetotolerans* BM-LA14527, a beer-spoilage bacteria. *FEMS Microbiology Letters* pii: fnw201.
Lozano GL, Holt J, **Ravel J**, Rasko DA, Thomas MG, Handelsman J. (2016) Draft genome sequence of biocontrol agent *Bacillus cereus* UW85. *Genome announcements* 4:300910-6.
Mair LO, Nacev A, Hilaman R, Stepanov P, Hausfeld J, Karlsson A, Shapiro B, **Shirtliff ME**, and Weinberg IN. (2016) Biofilm disruption: Rotating microrods remove microbes from surfaces, enhancing antimicrobial efficacy. *Journal of Magnetism and Magnetic Materials*, in press.
Maldarelli GA, Piepenbrink KH**, Scott AJ**, **Freiberg JA**, Song Y, Achermann Y, **Ernst RK, Shirtliff ME**, **Sundberg EJ**, **Donnenberg MS**, von Rosenvinge EC. (2016) Type IV pili promote early biofilm formation by *Clostridium difficile*. *Pathogens and Disease* 74:ftw061.
Meka RR, Venkatesha SH, **Dudics S**, Acharya B, **Moudgil KD**. (2015) IL-27-induced modulation of autoimmunity and its therapeutic potential. *Autoimmunity Reviews*. 14:1131-41.
Moudgil KD. (2015) Adaptive and innate immune modulators of inflammation and autoimmunity. *Cytokine* 75:v-ix.
Plaut RD, **Scanlon KM**, Taylor M, Teter K, **Carbonetti NH**. (2016) Intracellular disassembly and activity of pertussis toxin require interaction with ATP. *Pathogens and Disease* 74:ftw065.
Ramachandran G, Aheto K, **Shirtliff ME**, Tennant SM. (2016) Invasive *Salmonella* Typhimurium ST313 are poor biofilm producers. *Pathogens and Disease* 74:ftw049.
Ravel J, Brotman RM. (2016) Translating the vaginal microbiome: gaps and challenges. *Genome Medicine* 8:35.
Reimers LL, Mehta SD, Massad LS, Burk RD, Xie X, **Ravel J**, Cohen MH, Palefsky JM, Weber K, Xue X, Anastos K, Minkoff H, Atrio J, D'Souza G, Ye Q, Colie C, Zolnik CP, Spear GT, Strickler HD. (2016) The cervicovaginal microbiota and its associations with Human Papillomavirus (HPV) detection in HIV-infected and HIV-uninfected women. *The Journal of Infectious Diseases* pii:jiw374.
Rennoll-Bankert KE, Rahman MS, Guillote ML, Lehman SS, Beier-Sexton M, Gillespie JJ, **Azad AF**. (2016) RalF-mediated activation of Arf6 controls *Rickettsia typhi* invasion by co-opting phosphoinositol metabolism. *Infection and Immunity* 84:3496-506.
Richard K, **Vogel SN**, **Perkins DJ**. (2016) Type I interferon licenses enhanced innate recognition and transcriptional responses to *Franciscella tularensis* live vaccine strain. *Innate Immunity* 22: 363-72.
Robinson CK, Brotman RM, **Ravel J**. (2016) Intricacies of assessing the human microbiome in epidemiologic studies. *Annals of Epidemiology* 26:311-21.
Schmitt SK, **Shirtliff ME**. (2016) Hematogenous osteomyelitis in adults. In: *Infectious Diseases*. Up To Date Publishing Corporation. Wellesley, MA.
Scholz CFP, Brüggemann H, Lomholt HB, **Tettelin H**, Kilian M. (2016) Genome stability of *Propionibacterium acnes*: a comprehensive study of indels and homopolymeric tracts. *Scientific Reports* 6:20662.

Shaw DK, Kotsyfakis M, **Pedra JHF. (2016)** For whom the bell tolls (and nods): spit-acular saliva. *Curr*ent *Tropical Medicine Reports* 3:40-50.
Venkatesha SH, **Dudics S**, Astry B, **Moudgil KD**. (2016) Control of autoimmune inflammation by celastrol, a natural triterpenoid. *Pathogens and Disease* 74:ftw059.
Venkatesha SH, **Dudics S**, Weingaartner E, So EC, **Pedra J**, **Moudgil KD**. (2015) Altered Th17/Treg balance and dysregulated IL-1b response influence susceptibility/resistance to experimental autoimmune arthritis. *International Journal of Immunopathology and Pharmacology* 28:318.
Venkatesha SH, **Moudgil KD**. (2016) Celastrol and its role in controlling chronic diseases. *Advances in Experimental Medicine and Biology* 928:267.
Wang X, Shaw DK, Hammond HL, Sutterwala FS, Rayamajhi M, Shirey KA, Perkins DJ, Bonventre JV, Velayutham TS, Evans SM, Rodino KG, VieBrock L, Scanlon KM, Carbonetti NH, Carlyon JA, Miao EA, McBride JW, Kotsyfakis M, **Pedra JH**. (2016) The prostaglandin E2-EP3 receptor axis regulates *Anaplasma phagocytophilum*-mediated NLRC4 inflammasome activation. *PLoS Pathogens* 12:e1005803.
Wang X, Shaw DK, Sakhon OS, Snyder GA, Sundberg EJ, Santambrogio L, Sutterwala FS, Dumler JS, Shirey KA, Perkins DJ, Richard K, Chagas AC, Calvo E, Kopecký J, Kotsyfakis M, **Pedra JH. (2016)** The tick protein sialostatin L2 binds to Annexin A2 and inhibits NLRC4-mediated inflammasome activation. *Infection and Immunity* 84:1796-805.
Smith SB, **Ravel J**. (2016) The vaginal microbiota, host defense and reproductive physiology. *Journal of Physiology*, in press.
Van Lent S, De Vos WH, Huot Creasy H, Marques PX, **Ravel J**, Vanrompay D, Bavoil P. (2016) Analysis of polymorphic membrane protein expression in cultured cells identifies PmpA and PmpH of *Chlamydia psittaci* as candidate factors in pathogenesis and immunity to infection. *PLoS One* 11:e0162392.
Xu Z, Hou Y, Peters BM, Chen D, Li B, Li L, **Shirtliff ME**. (2016) Chromogenic media for MRSA diagnostics. *Molecular Biology Reports* 43:1025.
Xu Z, Xie J, Yang L, Chen D, Peters BM, **Shirtliff ME.** (2016) Characterization of a phage-like plasmid pCY-CTX carrying an ISEcp1-mediated Tn3-like element from *Enterobacter cloacae*. *Antimicrobial Agents and Chemotherapy*, in press.
Xu Z, Xie J, Yang L, Chen D, Peters BM, **Shirtliff ME**. (2016) Complete sequence of pCY-CTX, a plasmid carrying phage-like regions and an ISEcp1-mediated Tn2 element from *Enterobacter cloacae*. *Frontiers in Microbiol*ogy, in press.
Yu G, Gail MH, Consonni D, Carugno M, Humphrys M, Pesatori AC, Caporaso NE, Goedert JJ, **Ravel J**, Landi MT. (2016) Characterizing human lung tissue microbiota and its relationship to epidemiological and clinical features. *Genome biology* 17:163.
Yu G, Wen W, Peters BM, Liu J, Ye C, Che Y, Liu J, Cao K, Xu Z, **Shirtliff ME**. (2016) First report of novel genetic array *aacA4-blaIMP-25-oxa30-catB3* and identification of novel metallo-β-lactamase gene *blaIMP25*: A Retrospective study of antibiotic resistance surveillance on *Pseudomonas aeruginosa* in Guangzhou of South China, 2003-2007. *Microbial Pathogenesis* 17:62-7.

Abstracts and Oral Presentations
Allison DL, Harro J, Schlecht L, Shetty AC, Schwartz JA, **Bruno VM**, **Shirtliff ME**. (2016) *Candida albicans* induces vancomycin tolerance in *Staphylococcus aureus*. South Central Medical Mycology Meeting. Memphis, TN. November 18-19, 2016.
Arnold WB, Parvizi J, Harro JM, Achermann Y, Leid JG, **Shirtliff ME**. (2016) Synovial antibody levels against *Staphylococcus aureus* biofilm antigens used to detect PJI American Academy of Orthopaedic Surgeons. Orlando, FL. March 1-5, 2016.
Balzano PM, Barry EM. (2016) Loss of the MFS transporters *fptG* and *fptB* delays host exit of *Francisella tularensis*. Annual American Society for Microbiology Microbe Conference, Boston, MA.
Carbonetti NH. (2016) Pertussis pathogenesis and novel therapeutics. US-Japan Cooperative Medical Sciences Program, Acute Respiratory Infections Panel, Bethesda, MD, Jan 2016.
Carbonetti NH. (2016) Upregulation of lung pendrin expression is associated with inflammatory pathology in *B. pertussis* infection. Eleventh International Symposium on the Bordetellae, Buenos Aires, Argentina, April 2016.
Cunningham A. (2016) Creation and characterization of live attenuated diarrheal disease vaccines against ETEC and *Shigella*. UMB Graduate Research Conference, Baltimore, MD.
Cunningham A. (2016) Creation and characterization of live attenuated diarrheal disease vaccines against ETEC and *Shigella*. 50th Anniversary & 18th International Conference on Emerging Infectious Diseases in the Pacific Rim, Bethesda, MD.
Freiberg J, Le Breton Y, McIver K, **Shirtliff ME**. (2016) Identification and analysis of genes responsible for penicillin tolerance in *Streptococcus pyogenes* biofilms. American Society for Microbiology Microbe (ASM/ICAAC). Boston, MA. June 16-20, 2016.
Harro JM, Montalvo R, Manson T, O'Toole R, Joshi M, Zerhusen T, Natoli R, **Shirtliff ME**. (2016) Clinical validation of a novel ELISA serum assay test for detection of *Staphylococcus aureus* biofilm antibodies in serum of orthopedic trauma patients. Orthopaedic Trauma Association (OTA) Annual Meeting, National Harbor, Washington DC. Oct 05 - 08, 2016.
Kaczanowska S, Davila E. (2016) CD8-MyD88 – engineered T cells link MyD88 and T cell receptor signals to enhance anti-tumor responses. St. Jude National Graduate Student Symposium, Memphis, TN. Poster and Oral Presentation.
Kaczanowska S, Davila E. (2016) Amplifying T cell responses to tumor antigen using a synthetic CD8-MyD88 co-receptor. American Association of Immunologists Annual Meeting, Seattle, WA. Poster and Oral Presentation.
Kaczanowska S, Davila E. (2016) Amplifying T cell responses to tumor antigen using a synthetic CD8 MyD88 co-receptor. National Cancer Institute Graduate Student Recruiting Program, Bethesda, MD. Poster.
Ramachandran G, Aheto K, **Shirtliff ME**, Tennant SM. (2016) Reduced biofilm forming ability and long-term survival of invasive *Salmonella* Typhimurium ST3135th ASM Conference on *Salmonella*. Potsdam, Germany. Aug 29–Sept 1, 2016.
Ravel J. (2015) Interactions between the vaginal microbiota, the host and sexually transmitted infections. CNRS HPV/microbiota workshop, Montpellier, France, November 13, 2015.
Ravel J. (2015) A genomic journey from anthrax forensics to the human microbiome. National Academy of Sciences and Letters, Oslo, Norway, December 15, 2015.
Ravel J. (2016) Safety and regulatory issues associated with vaginal microbiota transplants: A case study. Exploring Human Host-Microbiome Interactions in Health and Disease, Wellcome Genome Campus Conference Centre, Hixton, Cambridge, UK, September 6-9, 2016.

Shirtliff ME. (2016) Clinical validation of a novel ELISA serum assay test for detection of *Staphylococcus aureus* biofilm antibodies in serum of orthopaedic trauma patients. Orthopaedic Trauma Association (OTA) Annual Meeting, National Harbor, Washington DC. Oct 05 - 08, 2016.
Shirtliff ME. (2016) Translational Research and Future Technologies in Orthopaedic Trauma Infections. Orthopaedic Trauma Association (OTA) Annual Meeting, National Harbor, Washington DC. Oct 05 - 08, 2016.
Shirtliff ME. (2016) Characterization of the antibiofilm and biomechanical properties of a PEEK-Silver zeolite Spacer for intervertebral fusion surgery. TechConnect. World Innovation Conference and Expo. Washington, D.C., May 23, 2016.
Shirtliff ME. (2016) Chronic Osteomyelitis and Biofilms. Medical Biofilm Techniques. Danish Technological Institute, Lyngby, Denmark, August 23, 2016.
Shirtliff ME. (2016) Biofilms in Food Safety: MRSA as a model. Southern China University of Technology, Guangzhou, Guangdong, China, May 22, 2016.
Shirtliff ME. (2016) Polymicrobial biofilms: systemic staphylococcal disease caused by *Candida albicans* infection. European Society of Clinical Microbiology and Infectious Diseases. Amsterdam, Netherlands, April 12, 2016.
Shirtliff ME. (2016) Combatting biofilm infections: from basic research to clinical practice. Chair. European Society of Clinical Microbiology and Infectious Diseases. Amsterdam, Netherlands, April 12, 2016.
Shirtliff ME. (2016) Microbial pathogenesis reloaded. Chair and Moderator. European Society of Clinical Microbiology and Infectious Diseases. Amsterdam, Netherlands, April 9, 2016.
Tettelin H. (2016) Host-pathogen interactions in cardiac microlesions formed during invasive pneumococcal disease. Pasteur Institute Department of Genomes and Genetics, Paris, France, March 24, 2016.
Tettelin H. (2016) CloVR comparative applications with S. pneumoniae and M. abscessus. “WS-16 Do it-yourself Microbial Genome Sequence Analysis” workshop, 1st American Society for Microbiology: Microbe Conference, Boston, MA, USA, June 16-20, 2016.
Tettelin H. (2016) The cloud virtual resource (CloVR) and the Sybil comparative genomics interface. “Meet the Expert” concurrent session on “Do-it-yourself genome analyses and data management.” 10th International Symposium on Pneumococci and Pneumococcal Diseases, Glasgow, United Kingdom, June 26-30, 2016.
Tettelin H. (2016) From TIGR4 to thousands of pneumococcal genomes in 15 years. Plenary session on Bacterial Genomics, 10th International Symposium on Pneumococci and Pneumococcal Diseases, Glasgow, United Kingdom, June 26-30, 2016.

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