The Center for Microbial Interface Biology (CMIB) is a multidisciplinary research center at Ohio State focused on discoveries in infectious diseases, microbe-host interactions and biodefense.
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LETTER FROM THE DIRECTOR

We proudly present the 2013 Annual Report for the Center for Microbial Interface Biology (CMIB). In its 7th year as a Board of Trustees-approved, campus-wide Center, the CMIB continues to grow in size, stature and impact, now achieving national and international recognition and acclaim. It is housed in the Office of Health Sciences within the Wexner Medical Center, and its hub is on the 7th floor of the Biomedical Research Tower (BRT). The Center continues to address the growing crisis in the US and worldwide related to death and suffering from a variety of infections and their complications. It does this by creating cutting edge broad-based interdisciplinary scientific platforms in an effort to enhance discoveries related to infectious diseases and facilitating synergy among investigators in the clinical and basic sciences from across the campus in partnership with others in academia and the private sector.

There were several highlights for the CMIB during the 2013 fiscal year. General faculty membership grew to 86 members. These faculty garnered newly awarded grant support in excess of $26 million, published over 340 papers, and received several local, regional, national, and international awards and honors. The CMIB had its fifth highly successful retreat in April 2013 with 202 registrants, including a keynote address on “Transmission and Prevention of HIV: A Thirty-Year Journey,” by Dr. Myron Cohen from The University of North Carolina at Chapel Hill, many exciting platform presentations and posters, and the distribution of several awards to trainees.

We face a challenge in support for biomedical research currently and in the near future. Investigators in the CMIB are responding to this challenge by diversifying their portfolios, in part by more effectively translating their discoveries into new diagnostics, therapeutics and vaccines. Our programs in drug discovery, microbial biofilms, anti-microbial resistance, and global health are becoming stronger by strategic hires and a growing portfolio in international partners and industry-sponsored research; the latter saw funding of $537,923 in 2013. We continue to be impressed with the Center’s achievements which are in no small part related to the unique community of science we have created where science and education are embraced and the spirit of camaraderie is unparalleled.

Larry S. Schlesinger, MD
Samuel Saslaw Professor of Medicine
Director, The Ohio State University Center for Microbial Interface Biology

John S. Gunn, PhD
Professor of Medicine
Vice-Director, The Ohio State University Center for Microbial Interface Biology
DESCRIPTION, MISSION, AND GOALS

The Center for Microbial Interface Biology (CMIB, cmib.osu.edu), created by Larry Schlesinger, MD, in November 2002, was awarded official University center status by the Ohio State University Board of Trustees in December 2006. The CMIB is a multidisciplinary research center focused on microbe-host interactions that promotes and coordinates interdisciplinary research and training opportunities in infectious diseases, microbial pathogenesis and biodefense. Its hub is located in the Biomedical Research Tower (BRT) which contains approximately 180,000 square feet of laboratories including several common user areas.

In 2013, general membership in the CMIB was comprised of 86 faculty members, representing 7 colleges across the Columbus and Wooster campuses. Core faculty members are defined as those whose recruitment package included membership in the CMIB. The collective CMIB faculty is involved in and represents the fields of immunology, cell biology, pathology, biochemistry and pharmacology, microbiology, genetics, structural biology, and bioinformatics.

The CMIB also manages the OSU campus Biosafety Level 3 core research facilities, which are available to the University research community, University collaborating researchers, and non-University researchers.

CMIB Mission Statement:
To enhance the quality and productivity of research by facilitating synergistic interactions among investigators in the clinical and basic sciences from across the campus

The goals of the CMIB are:
- promote and coordinate interdisciplinary research in the fields of infectious diseases and microbial pathogenesis (“intellectual hub”)
- develop training opportunities (both bench and classroom) for individuals with interest in the fields of infectious diseases and microbial pathogenesis
- discover new diagnostic tools, therapies and vaccines for infectious diseases, including diseases caused by the targeted microbes for bioterrorism
- enhance the national and international reputation of the University by positioning Ohio State University as an international leader in infectious diseases and microbial pathogenesis.
NEW MEMBERS

The CMIB was pleased to welcome six new members during the 2013 year.

**Beth Besecker, MD**  
**Internal Medicine – Pulmonary, Allergy, Critical Care, and Sleep Medicine**

Dr. Besecker, MD, is an Assistant Professor in the Division of Pulmonary, Allergy, Critical Care, and Sleep Medicine in the Department of Internal Medicine. Dr. Besecker obtained her medical degree from the Medical College of Ohio in Toledo and completed her Internal Medicine residency at Riverside Methodist Hospital in Columbus, Ohio. Dr. Besecker then completed her fellowship in Pulmonary and Critical Care Medicine at The Ohio State University in 2007. Dr. Besecker’s research interests involve studying nutritional impact on monocyte/macrophage phagocytosis as it relates to systemic bacterial clearance and sepsis. She is currently funded with an NIH K23 grant from the Center for Clinical and Translational Science to support her translational work in Innate Immune Cell Phagocytosis. She has presented her work at international meetings and has served on several American Thoracic Society committees.  
(http://lungcenter.osu.edu/aboutus/faculty/bethbeseckermd/)

**Thomas Cherpes, DVM, MD**  
**Microbial Infection and Immunity**  
**Obstetrics and Gynecology**

Thomas L. Cherpes, DVM, MD, is an Associate Professor in the Departments of Microbial Infection and Immunity and Obstetrics and Gynecology. He was recruited to OSU from the University of Pittsburgh in 2013. Dr. Cherpes laboratory is focused on modulation of host defense by hormonal contraceptives and *Chlamydia trachomatis* infection and host immunity. His laboratory recently showed that dendritic cell activation, virus-specific T cell expansion, and memory T cell development were impaired among female mice administered depot-medroxyprogesterone acetate (DMPA) prior to viral infection of mucosal tissue, and we now are enrolling women into clinical investigations of the immunomodulatory effects of several common hormonal contraceptive forms. Completion of this research will provide important comparative evaluation of the capacity of these drugs to modulate host defenses combating genital tract infection, eventually supplying healthcare providers more informed recommendations regarding appropriate hormonal contraceptive choices among women at risk for acquisition of HIV. In a longitudinal study of women with existing and treated *Chlamydia* infection, Dr. Cherpes’ lab recently discovered that peripheral T cells proliferating in response to chlamydial antigen were much more likely to secrete IL-4 than IFN-γ or IL-17. This work newly identified Th2 immunity as host defense against other intracellular bacterium. Current work in Dr. Cherpes’ lab seeks to confirm and extend these novel results.  
(http://medicine.osu.edu/mii/Faculty/thomascherpes/pages/index.aspx)
Steven Goodman, PhD  
Pediatrics, Nationwide Children’s Hospital

**Dr. Goodman,** PhD, is an Associate Professor of Pediatrics and a principal investigator in the Center for Microbial Pathogenesis at the Research Institute at Nationwide Children’s Hospital. Dr. Goodman’s research focuses on gene regulation in biofilms, and bacterial histones. ([http://cmib.osu.edu/people/faculty/stevengoodman/](http://cmib.osu.edu/people/faculty/stevengoodman/))

Gregg Hadley, PhD  
Microbial Infection and Immunity

**Gregg Hadley,** PhD, is a Professor in the Department of Microbial Infection and Immunity. Dr. Hadley’s laboratory has three primary research programs within the general area of transplant immunology. The first involves collaboration with investigators in the College of Engineering to develop a novel sensor technology as a replacement for biopsy to detect acute rejection in renal transplant recipients. The second area involves collaboration with investigators throughout the OSU campus to develop a device for successful transplantation of porcine pancreatic islet xenografts into human patients to treat type 1 diabetes. The third area is a continuation of his long-standing interest in the immune basis of tissue specific allograft rejection. ([http://medicine.osu.edu/mii/faculty/gregghadley/pages/index.aspx](http://medicine.osu.edu/mii/faculty/gregghadley/pages/index.aspx))

Jacob Yount, PhD  
Microbial Infection and Immunity

**Jacob Yount,** PhD, is an Assistant Professor in the Department of Microbial Infection and Immunity. He was recruited to OSU from The Rockefeller University. Dr. Yount’s laboratory aims to define cellular defense mechanisms active against viral pathogens. In particular, several proteins induced by the interferon family of cytokines inhibit influenza virus infection, yet individual interferon-induced proteins have not been successfully targeted for use in antiviral therapies due to challenges in understanding the molecular mechanisms by which such proteins inhibit infection as well as a lack of knowledge regarding their cellular regulation. Dr. Yount’s laboratory focuses on understanding post-translational modifications (PTMs) of immune system proteins as PTMs control protein activity.
and are tightly regulated by cellular enzymes. His laboratory is seeking to define the molecular mechanisms by two PTMs including palmitoylation. Dr. Yount’s laboratory is seeking to define the molecular mechanisms by which palmitoylated IFITM3 inhibits influenza virus and to identify the cellular enzymes that transfer PTMs onto IFITM3. These enzymes represent exciting targets for manipulation of cell biology for enhancing or decreasing the activity of this critical antiviral protein. His laboratory is using cutting edge chemical reporter technology for studying lipid PTMs and highly sensitive mass spectrometry, the laboratory is also defining additional modes of regulation for other immunomodulatory proteins toward the goal of improving microbial infection treatment and prevention approaches.

(http://medicine.osu.edu/mii/faculty/jacobyount/pages/index.aspx)

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**Jian Zhang, MD**

**Microbial Infection and Immunity**

**Jian Zhang**, MD, is an Associate Professor in the Department of Microbial Infection and Immunity. He was recruited to OSU from the University of Chicago. Dr. Zhang’s lab is primarily focused on molecular mechanisms of T cell activation and differentiation, and innate immune responses regulated by E3 ubiquitin ligases Cbl-b and Ned4. Dr. Zhang’s laboratory has successfully shown that Cbl-b is one of the key signaling molecules involved in both CD28- and CTLA-4-mediated T cell costimulation, which is necessary for controlling the threshold for T cell activation. His laboratory is also focused on the role of Cbl-b and Ned4 in innate immune responses. Further understanding of these E3 ubiquitin ligases in innate and adaptive immunity will result in the development of therapeutic invention for human diseases such as rheumatoid arthritis, multiple sclerosis, type 1 diabetes, asthma, and infectious disease.

(http://medicine.osu.edu/mii/faculty/jianzhang/pages/index.aspx)
LEADERSHIP

**Larry Schlesinger, MD**, Samuel Saslaw Professor of Medicine, Department of Microbial Infection and Immunity
Director, Center for Microbial Interface Biology
Chair, Microbial Infection and Immunity
Director, Medical Scientist Training Program

**John Gunn, PhD**, Professor of Medicine, Department of Microbial Infection and Immunity
Vice Director and Associate Director for Operations, Center for Microbial Interface Biology
Vice Chair, Microbial Infection and Immunity
Director, Biomedical Science Major

**Samantha King, PhD**, Associate Professor of Medicine, Department of Pediatrics
Organizer, Host-Pathogen Seminar Series, Center for Microbial Interface Biology

**Robert Munson, PhD**, Professor of Medicine, Department of Pediatrics
Associate Director for Education, Center for Microbial Interface Biology

**Joanne Turner, PhD**, Associate Professor of Medicine, Department of Microbial Infection and Immunity
Associate Director for Programming, Center for Microbial Interface Biology
FACULTY MEMBERSHIP

College of Arts and Sciences
Irina Artsimovitch, PhD
Michael Ibba, PhD
Chad Rappleye, PhD
Natividad Ruiz, PhD
Stephanie Seveau, PhD
Hua Wang, PhD
Ahmed Yousef, PhD

College of Dentistry
Michael Bailey, PhD
Ann Griffen, DDS
Eugene Leys, PhD
John Sheridan, PhD

College of Food, Agricultural, & Environmental Sciences
Pierluigi (Enrico) Bonello, PhD
Kenneth Lee, PhD
Jianrong Li, PhD
Yehia Mohamed Saif, DVM, PhD, ACVM, ACPV

College of Medicine
Brian Ahmer, PhD
Amal Amer, MD, PhD
Lauren Bakaletz, PhD
Beth Besecker, MD
Thomas Cherpes, DVM, MD
Mark Drew, PhD
Jennifer Edwards, PhD
Emilio Flano, PhD
Mikhail Gavrilin, PhD
Steven Goodman, PhD
John Gunn, PhD
Gregg Hadley, PhD
Don Hayes, Jr. MD, MS
Sheryl Justice, PhD
Samantha King, PhD
Susan Koletar, MD, FACP
Jesse Kwiek, PhD
William Lafuse, PhD
Yusen Liu, PhD
Amy Lovett-Racke, PhD
Stanley Martin, MD
Kevin Mason, PhD
Brad McGwire, MD, PhD
Asuncion Mejias, MD, PhD
| College of Medicine continued  |  |
|-------------------------------|  |
| Robert Munson, PhD            | Jordi Torrelles, PhD |
| Abigail Norris Turner, PhD    | Joanne Trgovich, PhD |
| Preeti Pancholi, PhD          | Susheela Tridandapani, PhD |
| Vijay Pancholi, PhD           | Joanne Turner, PhD |
| Michael Para, MD              | James Waldman, PhD |
| Deborah Parris, PhD           | Christopher Walker, PhD |
| Santiago Partida-Sanchez, PhD | Shu-Hua Wang, MD, MPH, TM |
| Mark Peeples, PhD             | Mark Wewers, MD |
| Octavio Ramilo, MD            | Caroline Whitacre, PhD |
| Abhay Satoskar, MD, PhD       | Daniel Wozniak, PhD |
| Larry Schlesinger, MD         | Kristine Yoder, PhD |
| Kurt Stevenson, MD, MPH        | Jacob Yount, PhD |
|                               | Jian Zhang, MD |
| College of Pharmacy           |  |
| Daren Knoell, PhD             | Karl Werbovetz, PhD |
| Werner Tjarks, Dr. rer.nat    |  |
| College of Public Health      |  |
| Alison Norris, PhD            |  |
| College of Veterinary Medicine |  |
| Kathleen Boris-Lawrie, PhD    | Stefan Niewiesk, DVM, PhD, ECLAM |
| Prosper Boyaka, PhD           | Tracey Papenfuss, DVM, PhD, ACVP |
| Wondwossen Gebreyes, DVM, PhD | Gireesh Rajashekara, DVM, PhD |
| Renukaradhya Gourapura, PhD   | Yasuko Rikihisa, PhD |
| Patrick Green, PhD            | Linda Saif, PhD |
| Jeffrey Lakritz, DVM, PhD, ACVIM | Li Wu, PhD |
Fiscal Year 2013 awards for new research grants to CMIB membership faculty included:

- **Celecoxib derivative: Host cell-directed inhibitors of intracellular pathogens**, R21: NIAID/NIH. **Kristy Ainslie, PhD**, College of Pharmacy. Therapies that target the host cell rather than the bacteria, which traditional antibiotics primarily focus, can help to combat pathogens that have drug resistance. AR-12 is an antibiotic that has shown broad spectrum activity against multiple bacterial pathogens by primarily effecting the infected host cell. The grant will further evaluate AR-12 in animal models against bacteria that cause salmonella, tularemia, drug susceptible tuberculosis and multi-drug resistant tuberculosis.

- **The center for HIV RNA studies (CRNA)**, P50: NIGMS/NIH. **Kathy Boris-Lawrie, PhD**, College of Veterinary Medicine. The CRNA focuses on determining the structural and mechanistic bases of HIV-1 RNA dependent replication functions at the cellular, viral and atomic levels in order to define RNA-based antiviral treatments for human and animal diseases.

- **Regulatory myeloid cells in inflammatory disease: Therapy and targeted generation with micro particles**, R21: NIAID/NIH. **Tracey Papenfuss, PhD**, College of Veterinary Medicine. Experimental autoimmune encephalitis (EAE) is a disease model for multiple sclerosis, for which there is no cure. The induction of tolerogenic DCs (tDC) is an exciting new approach for the treatment of this and other
inflammatory diseases. Currently, this approach is limited by our understanding of tDCs and by the ability to generate these tDCs in vivo during inflammatory disease. Our studies show that estriol (E3), generates tDCs, which protect mice from inflammatory EAE. In this proposal, we use newly developed micro particles (MPs) encapsulating E3 to induce tDCs in vivo to treat inflammatory disease EAE and investigate the signaling mechanisms involved in E3 tDC induction. The use of such MP technology and a better understanding of signaling pathways critical for tDCs induction has direct therapeutic applications in numerous immune-mediated, autoimmune and chronic inflammatory diseases.

- **Biogenesis of peptidoglycan in Escherichia coli**, R01: NIGMS/NIH.  
  **Natividad Ruiz, PhD**, College of Arts and Sciences. The increase in antibiotic resistance is a world-wide problem that can be combated by developing new antibiotics. This project seeks to understand the function of an unexplored antibiotic target, the essential bacterial protein MurJ. Our research will (1) facilitate the future development and characterization of novel MurJ inhibitors, and (2) advance our knowledge of a family of proteins related to MurJ that includes factors involved in bacterial pathogenesis and certain forms of the human congenital metabolic diseases collectively known as CDG.

- **Treating cutaneous leishmaniasis by radio-frequency induced heat (RFH) therapy**, R34: NIAID/NIH.  
  **Abhay Satoskar, PhD**, College of Medicine. Cutaneous leishmaniasis is caused by Leishmania parasites. This infection is a global health problem and a neglected tropical disease. This disease has also affected several US Army personnel serving in Iraq and Afghanistan as well as canine populations in the US. Current treatment of CL involves 20 injections of pentavalent antimonial drugs which are toxic and have poor patient compliance. The goal of this proposal is to plan a Phase III open label multicenter clinical trial to compare long-term efficacies of conventional antimonial injection treatment versus a single topical RF-induced heat therapy in treatment of CL in patients living in Leishmania endemic regions of India, Peru, Guatemala and Ethiopia.

- **Brain region dependent trafficking of myeloid precursor cells in repeated defeat**, R01: NIMH/NIH.  
  **John Sheridan, PhD**, College of Dentistry. Psychosocial stressors are associated with an increased prevalence of mental health complications including anxiety and depression. While it is known that social stressors negatively affect health and quality of life, the mechanisms that underlie these neurobehavioral deficits are not well understood. The goal of this proposal is to understand how stress-associated promotion of myeloid cell trafficking to the brain contributes to neuroinflammation and the promotion of long-lasting anxiety-like behavior. Completion of this goal may lead to novel interventions to target myeloid cell trafficking to the central nervous system and attenuate prolonged neurobehavioral complications associated with chronic stress. ([http://www.dent.ohio-state.edu/news/2013/06-30-2013_Sheridan_NIH.php](http://www.dent.ohio-state.edu/news/2013/06-30-2013_Sheridan_NIH.php))

- **Function of human lung mucosal hydrolases during M. tuberculosis infection**, R01: NIAID/NIH.  
  **Jordi B. Torrelles, PhD**, College of Medicine. One third of the world is infected with *Mycobacterium tuberculosis* (*M.tb*) killing one person worldwide every 14 seconds. This application will determine how mucosal degradative enzymes of the human lung surfactant alter the cell wall of *M.tb* influencing the immune response of the host and impacting the course of *M.tb* infection.
Research Spotlight – Program Project Grant on Tuberculosis and Aging

A Program Project Grant (PPG), led by Dr. Joanne Turner was submitted to the National Institute on Aging in 2012. The overarching hypothesis of the Program Project Grant (PPG) is that age associated changes in oxidative stress and inflammation (inflammaging) can have a profound impact on how the host interacts with M.tb throughout every point of contact with soluble and cellular components and that these changes are ultimately responsible for improving the survival and persistence of M.tb, leading to increased potential for developing active TB disease in old age.

The goal of the PPG is to investigate the impact of inflammaging throughout the continuum of M.tb infection to elucidate the biological mechanism for the increased susceptibility of the elderly to develop active TB disease.

Project leaders and co-leaders were Joanne Turner (MI&I), Jordi Torrelles (MI&I), Larry Schlesinger (MI&I), William Lafuse (MI&I), Murugesan Rajaram (MI&I), Emilio Flano (RINCH), Shu-Hua Wang (IM), Patrick Ross (Surg), and Jeff Pan (Biostatistics).

The P01 received a score of 33 in 2012. The proposal was resubmitted in 2013, receiving an outstanding score of 20. Research related to this PPG application was supported by a PHPID program grant initiative that provided $100,000 over two years for research costs to enhance project preliminary data. The PPG will be resubmitted in January 2014.
Research Spotlight – Antimicrobial Drug Discovery Interest Group

The goal of the Antimicrobial Drug Discovery Interest Group is to bring together infectious disease researchers from the Colleges of Medicine, Biological Sciences, and Veterinary Biosciences with drug discovery and development experts from the College of Pharmacy to maximize the chance of success and sustainability in anti-infective drug development. Current efforts employ studies to find new approaches to attack pathogens with small molecule drugs. Strategies include: screening available synthetic compound and natural product libraries using both target-based and whole-cell assays to identify hit compounds, hit-to-lead and lead optimization studies of molecules with known activity against promising targets and/or pathogens to optimize their in vivo efficacy and pharmaceutical properties, and investigating new combinations of existing and investigational drugs to develop new therapeutic approaches with improved efficacy and reduced likelihood for the development of resistance. Some of the current drug discovery and development highlights from CMIB investigators are listed below:

Antibacterial

- The Gunn lab has identified inhibitors of *Salmonella* biofilms through screening a small molecule library of kinase inhibitors.
- The Wozniak lab has discovered inhibitors of biofilm formation in *Pseudomonas aeruginosa* through screening this kinase inhibitor library.
- Small molecules with activity against *Campylobacter jejuni* have been identified by the Rajashekara lab.
- The Yousef lab has discovered novel antimicrobial peptides that may have utility in protecting the food supply and in treating bacterial infections.
- The Schlesinger lab has several ongoing anti-tuberculosis drug discovery efforts, including the optimization of the anticancer compound OSU-03012 for activity against *Mycobacteria* (in collaboration with the Chen lab) and the discovery of antimycobacterial compounds from a kinase inhibitor library.

Antifungal

- In collaboration with laboratories in the College of Pharmacy, the Rappleye lab has identified two classes of small molecules with activity against *Cryptococcus* and *Histoplasma*.

Antiprotozoal

- In collaboration with various labs, The Drew lab has identified several classes of molecules with in vitro antimalarial activity. One such collaborator is the Rakotondraibe lab, which has isolated a natural product with promising in vitro antimalarial activity.
- The Werbovetz lab has identified a lead compound synthesized by collaborators at Georgia State University that possesses oral activity against murine visceral leishmaniasis in vitro and that displays synergistic antileishmanial activity with antifungal azoles in vitro.
- The Satoskar lab is working on several classes of antileishmanial compounds.
Research Partners

OSU Partners
Center for Clinical and Translational Science
Nationwide Children’s Hospital
  Center for Microbial Pathogenesis
  Center for Vaccines and Immunity
Targeted Investment in Excellence Program
  Public Health Preparedness for Infectious Diseases
Wooster Campus, Ohio Agricultural Research and Development Center

Industry Contracts
Alios BioPharma, Inc.
Amgen, Inc.
Arno Therapeutics, Inc.
Bristol-Myers Squibb Co
Cepheid
Gilead Sciences, Inc
GlaxoSmithKline
Harrington Discovery Institute at University Hospitals of Cleveland
Janssen Therapeutics (A Johnson & Johnson Company)
Mead Johnson Nutrition
Merck & Co, Inc
Merus B.V.
Nanosphere, Inc.
Optimer Pharmaceuticals, Inc.
OptumInsight Life Sciences, Inc
Pfizer, Inc.
Phthisis Diagnostics, Inc.
Principia Biopharma
Quidel Corporation
Social & Scientific Systems, Inc.
Thermosurgery Technologies, Inc.

Ongoing Industry Partners
Antech Diagnostics
Biocomposites, Ltd
Boehringer-Ingelheim pharmaceutical company
Crucell
IDEXX laboratory
International Paint
Medimmune
MetalloPharm
Navidea Biopharmaceuticals
Novaflex
Philips Oral Healthcare
Sorrento
Publications

CMIB Faculty Publications, by calendar year

Prominent Journal of CMIB Publications
INVITED GUESTS AND SEMINAR SERIES

Host-Pathogen Seminar Series
The CMIB Host-Pathogen Seminar Series brought four internationally recognized experts in microbe-host interactions to campus during the 2013 fiscal year.

September 10 Samuel I. Miller, MD, Professor of Medicine, Microbiology and Genome Sciences; Director, Research Center of Excellence in Biodefense and Emerging Infectious Diseases; Director, Cystic Fibrosis Research and Development Program, University of Washington
“Are pathogenic bacteria just looking for food? The evolutionary interplay between humans and bacteria”
* Co-sponsored by Public Health Preparedness for Infectious Diseases & Department of Microbial Infection and Immunity

November 5 Hank Seifert, PhD, John E. Porter Professor of Biomedical Research and Associate Chair, Department of Microbiology-Immunology, Northwestern University's Feinberg School of Medicine
“Mechanisms used by *Neisseria gonorrhoeae* to co-exist with human innate and adaptive immune systems”
* Co-sponsored by the Center for Microbial Pathogenesis at The Research Institute at Nationwide Children’s Hospital and Departments of Microbiology and Microbial Infection and Immunity

April 8 Nicole Baumgarth, DVM, PhD, Professor and Chancellor’s Fellow, Center for Comparative Medicine; Chair, Graduate Group in Immunology, University of California
“A case of memory loss: Local humoral responses to influenza virus infection”
* Co-sponsored with Department of Microbial Infection and Immunity

May 13 Joseph Sodroski, MD, Professor of Microbiology and Immunobiology, Division of Immunology, Dana-Farber Cancer Institute, Harvard Medical School
“Structure and Neutralization of the HIV-1 Envelope Glycoprotein Trimer”
* Co-Sponsored by Dept. of Microbial Infection and Immunity, Dept. of Veterinary Biosciences, Center for Retrovirus Research and Ohio Agricultural Research and Development Center
Seminar Co-Sponsorships

November 27  Marsha Wills-Karp, PhD, Chair & Professor, Department of Environmental Health Sciences, Johns Hopkins Bloomberg School of Public Health
“Innate and adaptive immune responses in asthma”
* Co-sponsored by the Center for Microbial Interface Biology

February 12  Arturo Casadevall, MD, PhD, Professor, Department of Microbiology & Immunology and Department of Medicine (Infectious Diseases); Chair, Department of Microbiology & Immunology, Leo and Julia Forchheimer Chair in Microbiology & Immunology, Albert Einstein College of Medicine
“Thoughts on the Origin of Microbial Virulence”
* Co-sponsored by Center for Microbial Interface Biology

June 4  Clifford V. Harding, MD, PhD, Kahn Professor and Chair of Pathology, Director, Medical Scientist Training Program, Case Western Reserve University/University Hospitals Case Medical Center
“Regulation of macrophages by Mycobacterium tuberculosis and the roles of lipoproteins and TLR2”
* Co-Sponsored by Center for Microbial Interface Biology

CMIB Research Retreat

April 18-19  Myron Cohen, MD, J. Herbert Bate Distinguished Professor of Medicine, Microbiology and Immunology, and Public Health, The University of North Carolina at Chapel Hill
"Transmission and Prevention of HIV: A Thirty-Year Journey"
EDUCATION

Dr. Robert Munson (Department of Pediatrics) serves as the Associate Director for Education for the CMIB. Dr. Munson coordinates all CMIB-education related matters (current curriculum, initiating new classes, etc. which are done in conjunction with established educational programs as appropriate such as the Biomedical Sciences Graduate Program, Department of Microbiology, etc.).

Drs. John Gunn and Deborah Parris (Department of Microbial Infection and Immunity and Molecular Virology Immunology and medical Genetics, respectively) are faculty liaisons in the Biomedical Sciences Graduate Program in the area of emphasis of Microbial Pathogenesis. Dr. Joanne Turner (Department of Microbial Infection and Immunity and Immunology) is the faculty liaison in the Biomedical Sciences Graduate Program in the area of emphasis of Immunology. Several CMIB faculty members contribute lectures to the Host Defense block taught to 1st year medical students in conjunction with the Division of Infectious Diseases and the Department of MVIMG.

The CMIB has developed several educational initiatives and plays a leadership role in graduate level classroom learning in microbial pathogenesis and immunology. Several graduate level courses are available that help contribute to the areas of emphasis specialization in IBGP as well as credit towards graduation in graduate programs in other colleges (courses are cross-listed).
RESEARCH RETREAT

The CMIB hosted its fifth research retreat on April 18-19, 2013. The Biomedical Research Tower (BRT) and the Davis Heart and Lung Research Institute (DHLRI) were selected as the venues based upon the outstanding facilities, convenient location, and accessibility. The presentations were held in room 170 DHRLI and poster presentations were held in room 115 BRT. The BRT lobby space was used for registration, posters, vendor exhibits, and food/beverages.

The retreat was well attended by approximately 215 registrants. 85 abstracts were submitted by trainees including graduate students, postdoctoral scientists, research assistants, research associates, fellows, and research scientists. Eight CMIB faculty members presented their work at the retreat representing a diverse array of research projects across the campus. The event is highlighted by the keynote speaker, Myron Cohen, MD, J. Herbert Bate Distinguished Professor of Medicine, Microbiology and Immunology, and Public Health, The University of North Carolina at Chapel Hill. Dr. Cohen spoke on "Transmission and Prevention of HIV: A Thirty-Year Journey". In addition to faculty, eight trainees with outstanding research abstracts were selected to give short talks. Awards for best posters and short talks were provided.

Best Poster Awards
Undergraduate Student Category:
Nandan Gokhale (PI: Joanne Turner), “Age-Dependent Differences in the Processing Of Mycobacterium Tuberculosis by Murine Macrophages”

Technician Category:
Smitha Sasindran (PI: Jordi Torrelles), “Influence of Human Alveolar Lining Fluid in Mycobacterium Tuberculosis-Host Cell Recognition”

Graduate Student Category:
1st Place: Jessica Mates (PI: Jesse Kwiek), “Genotypic and Phenotypic Heterogeneity in the U3R Region of HIV-1 Subtype C”
2nd Place: Joanna Marshall (PI: John Gunn), “O-ag Capsule-Deficient Mutants of Salmonella Typhimurium Exhibit Attenuated Virulence and Elicit Protection Against Lethal Infection”
3rd Place: Dawn Walker (PI: Mark Drew), “Plasmodium Falciparum Autophagy Protein Atg7 is Confirmed as the Activating Enzyme Essential for PfAtg8 Lipidation and Parasite Growth”
Post-Doctoral Researchers/Research Scientists Category: 
**Emily Butler**, PhD, Postdoctoral Fellow (PI: Natividad Ruiz), “Structure-Function Analysis of MurJ: A Protein Essential for Peptidoglycan Biogenesis”

**Short Talk Presentation Awards**

**Christopher Jones**, Graduate Student (PI: Dan Wozniak), “ChIP-Seq and RNA Seq Reveal an AmrZ-Mediated Mechanism for Cyclic di-GMP Synthesis and Biofilm Development By *Pseudomonas Aeruginosa*”

**Suresh de Silva**, Research Scientist (PI: Li Wu) “Promoter Methylation Regulates Gene Expression of the Retroviral Restriction Factor SAMHD1 in Human CD4+ T Cells”

The program was designed to include faculty from representative colleges at OSU and to showcase the broad research interests of faculty within the CMIB (basic research, translational, and clinical). Short talks were designed to provide trainees with valuable presentation experience and the opportunity to be awarded a travel grant to attend a scientific meeting. Poster sessions, including judging, were incorporated to provide trainees with experience at presenting their research findings and the opportunity to be awarded a travel grant. Poster sessions were also designed to encourage discussion amongst CMIB members with the goal of fostering collaborative research. Social events were incorporated throughout the retreat to facilitate discussion amongst CMIB members.
BIOSAFETY LEVEL 3 (BSL3) PROGRAM

The BSL3 Core Facilities are operated through the Center for Microbial Interface Biology (CMIB) and managed by Dr. Joanne Turner (BSL3 Program Director) and operated by Lena Lynch (Operations Manager) and Erin Dunlevy (Research Aide). BSL3 Program oversight includes a BSL3 Advisory Committee, BSL3 Operations Group and BSL3 User Group to oversee and assist research in the facilities and to provide communication and training to BSL3 users. In 2013 an Ohio BSL3 Users Group (OBUG) was established and operated through OSU, which brings together program leaders from multiple BSL3 facilities that are operated in the state of Ohio.

The BSL3 Core Facilities on campus include nearly 9,000 square feet of usable space at the following locations: West Campus Biocontainment Facility (2,560 ft²), Biomedical Research Tower 10th floor (2,775 ft²), and the Biomedical Research Tower Vivarium (3,370 ft²). The BSL3 Core Facilities are available to the Ohio State research community, Ohio State collaborating researchers and non-Ohio State researchers. A guidance document describing the procedures for conducting research in the BSL3 Core Facilities can be found online at the CMIB website (http://cmib.osu.edu/facilities/bsl3toc/).

The BSL3 facilities are home to nine Principal Investigators and 26 staff and researchers who spent 1759 hours working in the BSL3 facilities during fiscal year 2013. BSL3 research performed at OSU generated thirteen publications and was supported by 17 grants (NIH, USDA, Gates Foundation, AFAR, and PHPID) during fiscal year 2013.

Lena Lynch was recruited to OSU as the Operations Manager in fiscal year 2013. Lena brings to our program significant experience working with BSL3 related agents from Ohio Department of Health and Battelle that will further strengthen our program.

In fiscal year 2013, the BSL3 Program and the College of Medicine signed off on a MOU whereby the COM would provide fiscal subsidy to the BSL3 Program. The MOU is in place until 2017. The subsidy provides partial salary support for the BSL3 Operations Manager and Program Director. Remaining costs (equipment service contract, equipment purchase and repair, PPE) is recouped through a BSL3 user fee structure and COM Research Investment Fund requests.
## APPENDIX A: Research Awards

<table>
<thead>
<tr>
<th>PI</th>
<th>Title [Sponsor]. Identifier</th>
<th>Start Date</th>
<th>End Date</th>
<th>Direct Award</th>
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<td>Ahmer, Brian</td>
<td>Coordination of metabolism and virulence during infection [NIAID/NIH]. R01AI097116</td>
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<td>Ainslie, Kristy</td>
<td>Development of needle-free, multi-formulation nanoparticle vaccine [Henry M Jackson Fdn for the Advn Mil Med; Uniformed Services Univ Health Sci's]. 2364</td>
<td>5/1/2013</td>
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<td>Celecoxib derivative: Host cell-directed inhibitors of intracellular pathogens [NIAID/NIH]. R21AI102252</td>
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<td>Encapsulated active vitamin D vaccine for the treatment of multiple sclerosis  NINDS/NIH]. R21NS072813</td>
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<td>Amer, Amal</td>
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<td>Artsimovitch, Irina</td>
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<td>Bailey, Michael</td>
<td>Effect of maternal separation on gut microbiome [Texas Tech Univ; Sigma-Tau Healthscience SPA]. 12AM120148PN</td>
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<td>49,953</td>
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<td>Determinants of H. influenzae Virulence in Otitis Media [NIDCD/NIH]. R01DC003915</td>
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<td>Development of a transcutaneous immunization patch and assessment of the efficacy afforded against experimental otitis media due to nontypeable Haemophilus influenzae [The Ohio State University].</td>
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<td>Impact of phasevarions of non-typeable Haemophilus influenzae on otitis media pathobiology and vaccine development [Griffith University, Gold Coast Campus]. Novel immunotherapeutics for the management of otitis media due to H. influenzae [NIDCD/NIH]. R01DC011818</td>
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<td>Alternative approaches for NALT-based immunity to respiratory pathogens [NIAID/NIH]. R01AI043197</td>
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<td>The affect of hormones and oxygen-limitation on gonococcal pathophysiology [NIAID/NIH]. R01AI076398</td>
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<td>Hayes, Don</td>
<td>Viral Triggers of Alloimmunity and Autoimmunity in Pediatric Lung Transplantation [Washington University].</td>
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<td>Ibba, Michael</td>
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<td>Functional genomics of chemical induced acute lung injury [Univ of Pittsburgh; Nat Inst of Environ Health Scis]. 0022279(119844-1)</td>
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<td>A Phase Ib, dose ranging study of oral GSK1265744 in combination with nucleoside reverse transcriptase inhibitors for induction of HIV-1 virologic suppression followed by an evaluation of maintenance of virologic suppression (LAI116482) [GlaxoSmithKline]. LAI116482</td>
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<td>Carotid artery intima-media thickness (CMIT) imaging, brachial artery FMD imaging and single slice abdominal CT scans for the subjects enrolled on protocol ACTG A5260s [Social &amp; Scientific Systems, Inc; NHLBI/NIH]. CRB-UCLA1-S-10-00040</td>
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<td>Critical roles for iron and copper detoxification in Borrelia burgdorferi [NIAID/NIH]. R01AI103173</td>
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<td>Role and regulation of MKP1 in Sarcoidosis [WAYNE STATE UNIVERSITY].</td>
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<td>Mejias, Maria</td>
<td>A Multi-Center, Outpatient, Surveillance Study of Respiratory Syncytial Virus (RSV) Infection and RSV-related Hospitalizations Among Subjects &lt; 24 Months of Age with a Medically Attended Respiratory Tract Infection [Anonymous].</td>
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<td>Biomarkers for Identification of Chilean Infants at risk for Respiratory Syncytial Virus (RSV) and rhinovirus (RV) severe acute lower respiratory infection [University of Chile - Department of Pediatrics].</td>
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<td>Quidel molecular real-time PCR direct C. difficile ToxA/B assay [Quidel Corporation]. Quidel PCR ToxA/B assay</td>
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<td>Quality of life of HIV-infected patients switched to raltegravir versus other antiretroviral regimens [OptumInsight Life Sciences, Inc; Merck &amp; Co Inc]. LOA dated December 7, 2012</td>
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<td>A randomized, double-blind phase 3B study to evaluate the safety and efficacy of elvitegravir/cobicistat/emtricitabine/tenofovir disoproxil fumarate versus ritonavir-boosted atazanavir plus emtricitabine/tenofovir disoproxil fumarate in HIV-1... [Gilead Sciences, Inc]. GS-US-236-0128</td>
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<td><strong>Peeples, Mark</strong></td>
<td>Novel Calcium Release Mechanism regulates Dendritic Cell function [NIAID/NIH]. R01AI092117</td>
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<td>Center Initiative for Harvesting Respiratory Epithelium from Cystic Fibrosis Patients [Cystic Fibrosis Foundation (CFF)].</td>
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<td>Novel and practical approaches for mitigation of Campylobacter in poultry [Iowa State Univ; National Institute of Food &amp; Agriculture]. 416-23-11B</td>
<td>7/15/2012</td>
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<td>83,003</td>
<td>23,411</td>
<td>106,414</td>
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<td><strong>Ramilo, Octavio</strong></td>
<td>Systems Analysis of Vaccine Responses in Healthy and Hyporesponsive Humans [Baylor Research Institute].</td>
<td>8/1/2009</td>
<td>7/31/2014</td>
<td>105,144</td>
<td>47,104</td>
<td>152,248</td>
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<td>Use of Microarrays to Understand Systemic Arthritis [Baylor Research Institute].</td>
<td>9/1/2008</td>
<td>8/31/2013</td>
<td>47,917</td>
<td>21,083</td>
<td>69,000</td>
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<td>Rappleye, Chad</td>
<td>Virulence factor discovery in the secreted proteome of Histoplasma capsulatum [NIAID/NIH]. R01AI083335</td>
<td>8/1/2010</td>
<td>7/31/2014</td>
<td>205,821</td>
<td>102,911</td>
<td>308,732</td>
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<td>Rikihisa, Yasuko</td>
<td>Keys to prevent cholesterol robbery and infection by intracellular bacteria [NIAID/NIH]. R01AI099077</td>
<td>2/1/2012</td>
<td>1/31/2017</td>
<td>235,000</td>
<td>123,375</td>
<td>358,375</td>
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<td>Type IV secretion &amp; signal transduction in ehrlichiosis [NIAID/NIH]. R01AI054476</td>
<td>1/1/2010</td>
<td>12/31/2013</td>
<td>230,324</td>
<td>115,162</td>
<td>345,486</td>
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<td>Ruiz, Natividad</td>
<td>Biogenesis of peptidoglycan in Escherichia coli [NIGMS/NIH]. R01GM100951</td>
<td>7/5/2012</td>
<td>6/30/2016</td>
<td>175,000</td>
<td>79,001</td>
<td>254,001</td>
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<td></td>
<td>Susceptibility and protective immunity to Noroviruses [Univ of North Carolina; NIH]. 5-30028</td>
<td>4/15/2009</td>
<td>3/31/2014</td>
<td>48,667</td>
<td>24,333</td>
<td>73,000</td>
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<td>Enhancing rotavirus vaccine efficacy in infants from developing countries: Impact of vitamin A [Merck &amp; Co Inc]. Proposal #35907</td>
<td>1/11/2010</td>
<td>12/31/2012</td>
<td>20,000</td>
<td>4,000</td>
<td>24,000</td>
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<td>The breast milk, gut microbiome, and immunity (BMMI) project: Jumpstart phase [Washington Univ; Bill &amp; Melinda Gates Fdn]. WU-12-166</td>
<td>11/1/2011</td>
<td>10/31/2013</td>
<td>242,392</td>
<td>24,239</td>
<td>266,631</td>
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<td>Satoskar, Abhay</td>
<td>Chemoprevention and treatment of non-melanoma skin cancer by targeting MIF [National Cancer Institute]. R03CA164399</td>
<td>4/1/2012</td>
<td>3/31/2014</td>
<td>22,500</td>
<td>11,813</td>
<td>34,313</td>
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<td>Treating cutaneous leishmaniasis by radio-frequency induced heat (RFH) therapy [NIAID/NIH]. R34AI100789</td>
<td>8/10/2012</td>
<td>7/31/2014</td>
<td>150,000</td>
<td>78,750</td>
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<td>Schlesinger, Larry</td>
<td>TB and innate immune regulation of lung macrophages [NIAID/NIH]. R01AI059639</td>
<td>8/1/2012</td>
<td>7/31/2017</td>
<td>265,503</td>
<td>139,389</td>
<td>404,892</td>
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<td>Anti-TB drug discovery through lead optimization of protein kinase inhibitor OSU-03012 [Univ Hospitals of Cleveland]. Agreement dated 4/1/13</td>
<td>1/1/2013</td>
<td>12/31/2014</td>
<td>50,000</td>
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<td>Medical scientist training program-Ohio State University [NIGMS/NIH]. T32GM075787</td>
<td>7/1/2011</td>
<td>6/30/2016</td>
<td>475,320</td>
<td>21,225</td>
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<td>Sheridan, John</td>
<td>Brain region dependent trafficking of myeloid precursor cells in repeated defeat [National Institute of Mental Health]. R01MH097243</td>
<td>4/15/2013</td>
<td>1/31/2018</td>
<td>328,313</td>
<td>162,157</td>
<td>490,470</td>
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<td>Social threat primes myeloid progenitor cells and microglia: role in anxiety [National Institute of Mental Health]. R01MH093473</td>
<td>1/15/2012</td>
<td>12/31/2016</td>
<td>240,000</td>
<td>126,000</td>
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<td>Tjarks, Werner</td>
<td>Boronated nucleosides for neutron capture therapy of brain tumors [National Cancer Institute]. R01CA127935</td>
<td>12/8/2009</td>
<td>11/30/2014</td>
<td>170,279</td>
<td>83,395</td>
<td>253,674</td>
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<td>Torrelles, Jordi</td>
<td>Function of human lung mucosal hydrolases during M. tuberculosis infection [NIAID/NIH]. R01AI093570</td>
<td>8/20/2012</td>
<td>7/31/2016</td>
<td>250,000</td>
<td>131,250</td>
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<td>Tridandapani, Susheela</td>
<td>Novel monocyte effector function in CLL immune therapy [National Cancer Institute]. R01CA162411</td>
<td>4/18/2013</td>
<td>3/31/2018</td>
<td>77,813</td>
<td>41,370</td>
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<td>Turner, Joanne</td>
<td>Diagnosis of tuberculosis in the elderly [NIA/NIH]. R03AG041129</td>
<td>8/1/2012</td>
<td>7/31/2014</td>
<td>50,000</td>
<td>26,250</td>
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<td>Divergent macrophage-pathogen interactions in old age [Am Federation For Aging Research Inc]. Award ltr dtd 6/22/10</td>
<td>7/1/2010</td>
<td>6/30/2014</td>
<td>118,000</td>
<td>11,800</td>
<td>129,800</td>
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<td>Walker, Christopher</td>
<td>HCV-SPECIFIC T CELL RESPONSES IN CHIMPANZEES [NIAID/NIH]. R37AI047367</td>
<td>8/15/1999</td>
<td>12/31/2014</td>
<td>519,418</td>
<td>185,128</td>
<td>704,546</td>
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<td>Merck Immunospot [Anonymous]. Persistent hepatitis C virus replication and T cell immunity in pregnancy [NIAID/NIH]. R01AI096882</td>
<td>4/1/2013</td>
<td>9/30/2013</td>
<td>12,351</td>
<td>5,620</td>
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<td>Wang, Hua</td>
<td>Impact of antibiotic applications on resistance development in animal hosts [Pew Charitable Trusts]. Award dated 07/20/12</td>
<td>5/1/2012</td>
<td>2/28/2014</td>
<td>170,627</td>
<td>7,206</td>
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<td>Impact of soybean meal on aquaculture production and food safety [Ohio Soybean Cncl]. OSC 13-4-11</td>
<td>10/1/2012</td>
<td>6/30/2014</td>
<td>38,000</td>
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<td>Werbovetz, Karl</td>
<td>Antileishmanial lead optimization of quinazolines [NIAID/NIH]. R21AI101529</td>
<td>7/1/2012</td>
<td>6/30/2014</td>
<td>192,340</td>
<td>53,545</td>
<td>245,885</td>
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<td>Macrophage inflammasome regulation [NHLBI/NIH]. R01HL076278</td>
<td>7/1/2011</td>
<td>4/30/2015</td>
<td>238,000</td>
<td>124,950</td>
<td>362,950</td>
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<td>Whitacre, Caroline</td>
<td>CC-NIE Integration: Innovations to transition a campus core cyberinfrastructure to serve diverse and emerging researcher needs [Office of Cyberinfrastructure; NSF]. OCI-1246001</td>
<td>10/1/2012</td>
<td>9/30/2014</td>
<td>890,428</td>
<td>96,591</td>
<td>987,019</td>
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<td>MicroRNA modulation of immune function in multiple sclerosis [NIAID/NIH]. R21AI092417</td>
<td>8/15/2011</td>
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<td>125,000</td>
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<td>Wozniak, Daniel</td>
<td>Biofilms and immunity in chronic wounds [NINR/NIH]. R01NR013898</td>
<td>9/1/2012</td>
<td>6/30/2017</td>
<td>141,751</td>
<td>69,301</td>
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<td>Pseudomonas biofilms and immunity [NIAID/NIH]. R01AI097511</td>
<td>1/1/2013</td>
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<td>271,906</td>
<td>85,560</td>
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<td>Wu, Li</td>
<td>Novel host proteins in the HIV-1 preintegration complexes [NIAID/NIH]. R21AI102822</td>
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<td>6/30/2014</td>
<td>125,000</td>
<td>65,625</td>
<td>190,625</td>
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<td>The role of UBE2V1 in HIV-1 restriction in primary monocytes [NIAID/NIH]. R21AI098524</td>
<td>2/5/2012</td>
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<td>150,000</td>
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<td>Yoder, Kristine</td>
<td>The influence of H3 acetylation on chromatin dynamics and the SWI/SNF remodeling complex [Am Heart Assn-Great Rivers Affiliate]. 12POST9380003</td>
<td>1/1/2012</td>
<td>12/31/2013</td>
<td>45,000</td>
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<td>Studies of the molecular mechanism of retroviral integration [NIAID/NIH]. R21AI099854</td>
<td>2/1/2013</td>
<td>1/31/2015</td>
<td>62,500</td>
<td>33,177</td>
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<td>Yount, Jacob</td>
<td>Mechanistic analysis of a posttranslationally modified innate antiviral effector [NIAID/NIH]. R00AI095348</td>
<td>5/1/2013</td>
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<td>170,616</td>
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<td>Zhang, Jian</td>
<td>Cbl-b in T cell activation and autoimmunity</td>
<td>2/8/2013</td>
<td>6/30/2014</td>
<td>339,828</td>
<td>180,736</td>
<td>520,564</td>
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* = MPI
APPENDIX B: Published Works, 2013
Source: SciVal Experts Database


62. Lou, F; Huang, P; Neetoo, H; Gurtler, J; Niemira, B; Chen, H; Jiang, X; Li, J. High pressure inactivation of human norovirus virus-like particles provides evidence that the capsid of human norovirus is highly pressure resistant. *Applied and Environmental Microbiology* 2013, 78(15): 5320-5327.


70. Dwivedi, V.; Manickam, C.; Binjawadagi, B.; Renukaradhya, G. J. PLGA Nanoparticle Entrapped Killed Porcine Reproductive and Respiratory Syndrome Virus Vaccine Helps in Viral Clearance in Pigs. *Veterinary Microbiology* 2013, 166, 47–58.


86. Escosa-García, L.; Ramilo, O.; Mejias, A. High-Dose Daptomycin Use in Methicillin-Resistant Staphylococcus Aureus Disseminated Infection. *Anales de Pediatría* 2013, 78, 185–188.


92. Flores-García, Y.; Rosales-Encina, J. L.; Rosales-García, V. H.; Satoskar, A. R.; Talamás-Rohana, P. CD4 + CD25 + FOXP3 + Treg Cells Induced by rSSP4 Derived from T. Cruzi


120. Harding, C. M.; Tracy, E. N.; Carruthers, M. D.; Rather, P. N.; Actis, L. A.; Jr., R. S. M. Acinetobacter Baumannii Strain M2 Produces Type IV Pili Which Play a Role in Natural Transformation and Twitching Motility but Not Surface-Associated Motility. *mBio* 2013, *4*.


141. IV, W. A.; Kwiek, J. J. Role of the Placenta in Adverse Perinatal Outcomes Among HIV-1 Seropositive Women. *Journal of Nippon Medical School* 2013, 80, 90–94.


201. Kim, M; Ma, Y; Zhang, Y; Li, J; Shu, Y; Oglesbee, M. Hsp70-dependent antiviral immunity against cytopathic neuronal infection by vesicular stomatitis virus. *Journal of Virology* 2013, 87(19):10668-78.


APPENDIX C: Patents Issued


APPENDIX D-1: Faculty Accomplishments, Awards, and Honors

AMAL AMER

2012 Ad-hoc Member, Study Section LCMI. Lung Cellular, Molecular, and Immunobiology Study Section.
2013 Ad-hoc Member and Co-Chair, Special Emphasis Study Section.
2013 Ad-hoc Member, Special Emphasis Study Section.

MICHAEL T. BAILEY

Stazen Research Award, College of Dentistry, The Ohio State University. May 2013.

LAUREN BAKALETZ

College of Medicine Distinguished Professor Award, The Ohio State University, April 2013.

PROSPER BOYAKA

Distinguished Service Award from The American Association of Immunologists (AAI) for Service as Member and Chair of the AAI Minority Affairs Committee 2006-2012.

RENUKARADHYA GOURAPURA

“Junior Faculty Travel Award,” American Association of Veterinary Immunologists (AAVI), USDA/NIFA, to participate and present our laboratory research at the 6th International Veterinary Vaccines and Diagnostic Conference, Cairns, Queensland, Australia, July 29-August 1, 2012.

“Early Career Investigator Award,” American Association of Immunologists (AAI), to participate in Immunology 2013, 100th year of AAI annual meeting at Honolulu, Hawaii, May 3-7, 2013.

“Junior Faculty Travel Award,” American Association of Veterinary Immunologists (AAVI), USDA/NIFA, to participate and present our laboratory research in Immunology 2013, 100th year of AAI annual meeting at Honolulu, Hawaii, May 3-7, 2013.

PATRICK GREEN

Distinguished Alumni Hall of Fame, Xavier High School. September 2012.

JOHN GUNN

Nominated for The Ohio State University College of Medicine Distinguished Professor Award. 2012.
PLOS One Editorial Board Member. 2013.

DON HAYES JR.

Richard P. & Marie R. Bremer Medical Research Fund and William H. Davis Endowment for Basic Medical Research Award, The Ohio State University Center for Clinical & Translational Science Program. May 2013.


**MICHAEL IBBA**

2013 Fellow, American Academy of Microbiology.

2013 American Society for Microbiology/NSF-LINK Travel Award.

**DAREN KNOELL**

Elected as the Kimberly Professor of Pharmacy by College Faculty based on scholarly accomplishments while serving at The Ohio State University (major criteria; Full Professor with Tenure and maintaining an active research program). This professorship runs a three year term and comes with an annual discretionary fund of $30,000. May 2013.

**JIANRONG LI**

Nominee for Innovator of the year 2012, The Ohio State University, Columbus, OH. August 2012.

TechColumbus Innovation Awards-Semi-finalists, TechColumbus, Columbus, OH. August 2012.

**BRADFORD MCGWIRE**


**ABIGAIL NORRIS-TURNER**

Best oral presentation in the clinical sciences track, International Union Against Sexually Transmitted Infection (IUSTI) conference, Vienna, Austria. July 2013

**PREETI PANCHOLI**

Mass Spectrometry Applications to the Clinical Laboratory (MSACL-2013) Director award for travel and presentation at the MSACL-2013 meeting San Diego, CA in February, 2013.


Ad hoc reviewer (American Journal of Infection Control).

South Central Association for Clinical Microbiologist (SCACM) State Director Ohio. January 2012-present.

Department Promotion and Tenure committee (2013 to date).

Hospital Infection Control Committee (2005 to date).

Hospital Antibiotic Subcommittee (2005 to date).

Antimicrobial Stewardship Committee (2008 to date).

American Board of Medical Microbiology (ABMM): Board questions committee (2007-2012).

**SANTIAGO PARTIDA-SANCHEZ**

2013-Recipient, AAI Laboratory Travel Grant, AAI 2013, Centennial Meeting, Honolulu, HI. May 3-7, 2013.

**MARK PEEPLES**

Elected to the ‘Hall of Distinction,’ Shelby Senior High School, Shelby, Ohio, September 29, 2012.

**GIREESH RAJASHEKARA**


OARDC Multi-disciplinary Team Research Award for its efforts to reduce foodborne illnesses caused by fresh produce. The award, which is given every three years, honors research excellence by teams comprised of OARDC scientists from a range of fields. April 2013.

**LINDA SAIF**


Laboratory recognized as an International Reference Laboratory for Transmissible Gastroenteritis Virus of swine as designated by Office of International des Epizooties (OIE, World Organization for Animal Diseases), Paris, France. 1992-present.

OARDC Multi-disciplinary Team Research Award for its efforts to reduce foodborne illnesses caused by fresh produce. The award, which is given every three years, honors research excellence by teams comprised of OARDC scientists from a range of fields. April 2013.

College of Veterinary Medicine David White Research Award to honor an established College of Veterinary Medicine senior faculty member with a nationally recognized research program. This award provides a stipend for a postdoctoral researcher for 3 years. January 2013 – December 2015.
YEHIA SAIF

Laboratory is designated by the Office International Des Epizooties as the OIE Expert Lab for Infectious Bursal Disease Virus. This designation obligates us to supply reagents worldwide and we have responded to 12 such requests and responds to questions from different continents. 2000-present.


2013, Elected into the World Poultry Veterinary Association Hall of Honor. Membership of the WVPA Hall of Honor is for poultry veterinarians/poultry veterinary scientists whose contribution to WVPA and the world of poultry health management is recognized as exceptional by their peers. It is intended that admission to WVPA’s Hall of Honor will be the highest badge of honor for any avian veterinary scientists past, present or in the future. September 2013.


Recipient of the Meritorious Service Award at the North Central Avian Disease Conference. This award is given to individuals who have made outstanding contributions in the area of poultry health service. March 2013.

Recipient of the Ohio Poultry Association Golden Feather Award which is given annually to an individual who has distinguished himself as a champion of livestock agriculture or poultry issues. April 2013.

LARRY SCHLESINGER

Recipient of the 2012 Harrington Innovator Scholar.

JOANNE TURNER

Department of Microbial Infection & Immunity Excellence in Teaching Award. May 2013.

DANIEL WOZNIAK

2012 OSU Microbial Infection and Immunity Excellence in Teaching Award

LI WU

Pfizer (Zoetis) Award for Research Excellence, College of Veterinary Medicine, OSU, Ohio. May, 2013.

International travel award, UNESCO-ASM Visiting Resource Person Program, American Society for Microbiology, July 2012.

Visiting Professor, Soochow University, Suzhou, China. 2012-present.

JIANG ZHANG

American Association of Immunologists Laboratory Travel Award. May 2013.
APPENDIX D-2: Trainee Accomplishments, Awards, and Honors

Basant Abdulrahman (PI: Amal Amer):
• 2012 ASBMB Travel Award.

Ahmed Ali (PI: Kenneth Lee):
• Recipient of Richard B. Rimler Memorial Award, AAAP. 2013. This is an award recognizing excellence in poultry diseases research by a graduate student.

Valeria Artuso (PI: Wondwosen Gebreyes):
• Ponte CVM travel award.

B. Binjawadagi (PI: Renu Gourapura):

Astrid Bonnegarde-Bernard (PI: Prosper Boyaka):
• Travel Award for best presentation at the OSU Immunology Roundtable. Fall 2012.

Anna Conrad, PhD candidate (PI: Enrico Bonello):
• Honorable mention, Grant-in-Aid of Research competition, Ohio State University Chapter of Sigma Xi.
• H.A.J. Hoitink Graduate Education Scholarship, Plant Pathology Department, Ohio State University.
• SEEDS grant, Ohio Agricultural Research and Development Center, graduate research competition.

Tracy Carlson (PI: Larry Schlesinger):
• NIH K01 Award.
• CL Davis Foundation Student Scholarship Award.

Michael Carruthers (PI: Robert Munson Jr.):
• PHPID Travel Award used to fund, in part, travel to the 9th International Symposium on the Biology of Acinetobacter.

Maria Cernada, MD (PI: Asuncion Mejias):

Kshipra Chandrashekhar (PI: Gireesh Rajashekara):
• Food Innovation Center (FIC), Travel grant for 2013 AAAP/AVMA Annual Meeting Chicago, Illinois; July 19-23, 2013.
• The PHPID Travel grant, The Ohio State University, Travel award for CHRO 2013, 17th International Workshop on Campylobacter, Helicobacter and Related Organisms, Aberdeen, United Kingdom.

Nicholas Chesarino (PI: Jacob Yount):
• OSU Systems and Integrated Biology Training Grant Fellowship, Sponsored by the NIH/NIGMS, T32GM068412.

Kyle Caution (PI: Amal Amer):
• 2012-2013 Nomination for The Ohio State University Presidential Fellowship by Biomedical Science Graduate Program.

Douglas Culbertson (PI: Jianrong Li):
• Won OSU SOLAR Undergraduate Research Grant Award

Lauren E. Diangelo (PI: Jordi Torrelles):
• 2013 Accepted for admission to The Ohio State University College of Veterinary Medicine.

Erin DiCaprio (PI: Jianrong Li):
• PhD student won Ohio Agricultural Research and Development Center (OARDC) Graduate Student Research Grant ($5,000); 2012.
• Named a fellow ($50,000) for USDA NoroCORE in 2013;
• Won American Society for Virology Travel award in 2013.

Nathan Dissinger (PI: Patrick Green):
• 2013 American Society of Virology Travel Award.
• 2012-2014 Ohio State University Barber Research Award.

Yue Duan (PI: Jianrong Li):
• Won American Society for Virology Travel award in 2013.

Marlie Dulaurier (PI: Asuncion Mejias):
• “Impact of Secondhand Smoke Exposure in Immune Profiles and Clinical Outcomes of Infants with Respiratory Syncytial Virus Infection.” 2013 AAP Julius B. Richmond New Investigator Award. $12,000/year 2013-2014

Christina Durcholz (PI: Jesse Kwiek):
• Recipient of OSU Roessler 1-year Fellowship.
• Recipient of American Medical Association Seed Grant, 2012-2013.

Heather Eccleston (PI: Christopher Walker):
• Oral presentation at HCV 2012 Annual Meeting, Venice, Italy, October 2012.

David Fischer (PI: Linda Saif):
• OSU CVM David White Awardee, which pays post-doc salary from 2012-2015.

Corine St. Gelais (PI: Li Wu):
• Recipient of a travel fund from the OSU Public Health Preparedness for Infectious Diseases Program for her oral presentation at Retrovirus meeting, May 2013.

Devyn Gillette (PI: Susheela Tridandapani):
• AAI Minority Trainee Scientist Travel Award – May 2013.
Geoffrey Gonzalez (PI: John Gunn):
- ASM Student Travel Grant to attend the 6th ASM Conference on Biofilms in Miami, Florida.
- Selected for the Seventh Annual NIH National Graduate Student Research Conference, NIH Campus.
- 2013 OSUWMC Trainee Research Day Poster award winner.

Christian Harding (PI: Robert Munson Jr.):
- PHPID Travel Award used to fund, in part, travel to the 9th International Symposium on the Biology of Acinetobacter.

Matthew Haddad (PI: Kevin Mason):
- President’s Circle Committee Recipient of Summer Funding for Research Internship in the Mason Laboratory.

Santtu Heinonen, MD (PI: Asuncion Mejias):
- “Immunology of RSV infection in Children.” European Society for Infectious Diseases (ESPID) Fellowship Award. $40,000/year 2013-2015.

Kristin Hines (PI: Sam King):
- 2013 COM Medical Student Research Scholarship.

Jagadish Hiremath (PI: Renukaradhya Gourapura):
- Best Poster Presentation and AAVI-AAI Young Investigator Award at the Conference of Research Workers in Animal Diseases, Chicago, IL, December 2013.

Danielle House (PI: Larry Schlesinger):
- HHMI Med to Graduate. 2012-present.

Nicholas Jarjour (PI: John Gunn):
- Goldwater Award Honorable Mention

Junbae Jee (PI: Prosper Boyaka):
- Travel Award for trainee with abstract selected for oral presentation at the annual meeting. The American Association of Immunologists (AAI).
- Travel Award for best presentation at the OSU Immunology Roundtable. Fall 2012.

Sarah Johnson (PI: Mark Peeples):
- Travel Award “International RSV Symposium,” Santé Fe, NM, September 2012.

Arwa Abu Khweek (PI: Amal Amer):
- 2013 ASBMB Travel award.

Anand Kumar (PI: Gireesh Rajashekara):
- OARDC professional growth scholarship program for CRWAD meet, December 8-10, 2013, Chicago, Illinois, USA.

Audrey Lloyd (PI: Sam King):
• 2013 Travel Award, 12th Annual OSUMC Trainee Research Day.

**Fangfei Lou, PhD (PI: Jianrong Li):**
• Won American Society for Virology Travel award in 2013
• Received a graduate student grant ($5,000) from OARDC in 2013

**Sankalp Malhotra (PI: Lauren Bakaletz):**
• Biomedical Sciences Graduate Program Travel Award, The Ohio State University, December 2012.

**Cordelia Manickam (PI: Renukaradhya Gourapura):**
• Immunopathogenesis and immunomodulation caused by PRRSV strain VR2332. PhD dissertation, The Ohio State University, 2013.

**Joanna Marshall (PI: John Gunn):**
• 2013 Washington University Global Health and Infectious Disease Conference Poster award winner.

**Julius Medardus (PI: Wondwossen Gebreyes):**
• PHPID equipment seed award.

**Megan Mefford, PhD (PI: Jesse Kwiek):**
• Recipient of CMIB T32 Fellowship, 2012-present.

**Dipu Mohan-Kumar (PI: Yasuko Rikihisa):**
• ASM Student Travel Award, and “Outstanding Student Poster honor.”

**Hongyan Liu (PI: Yasuko Rikihisa):**
• VBS distinguished publication award. “Ehrlichia type IV secretion effector ECH0825 is translocated to mitochondria and curbs ROS and apoptosis by upregulating host MnSOD.” Cellular Microbiology 14(7): 1037-1050, 2012.

**Juan Ignacio Moliva (PI: Jordi Torrelles):**
• Invited Oral presentation at the 5th Center for Microbial Interface Biology 2013 Retreat, April 18-19, 2013. “Rethinking the BCG Vaccine: Role of the Lung Microenvironment.” The Ohio State University, Columbus, Ohio.
• 2013 Recipient of the College of Medicine Systems and Integrative Biology (SIB) Training Program Fellowship. “Rethinking the BCG Vaccine: Role of the Lung Microenvironment.

**Michael Niger (PI: John Gunn):**
• 2012 SOLAR Fund Undergraduate Research Award, Thermo Fisher Pierce Scholarship.

**Laura Novotny (PI: Lauren Bakaletz):**
• 4th Annual Center for Clinical and Translational Science Meeting and 5th Annual Appalachian Health Summit, Best Poster Award, May 6, 2013.

**Amin Osman (PI: Sam King):**
• David V. Perry and Isabel H. Perry Research Scholarship Fund.
Molly Osterhage (PI: Kristine Yoder):
• 2013 Mayers Summer Research Scholarship
• 2014 SOLAR Foundation Research Award

Rebecca Ortiz (PI: Emilio Flano):
• Selected for Oral Presentation at the 8th International RSV symposium, Santa Fe, 2012.

Kang Ouyang (PI: Renu Gourapura):
• “Best Poster Award.” Development and validation of an assay to detect porcine reproductive and respiratory syndrome virus specific neutralizing antibody titers in pig oral fluid samples. PHPID Annual Member Meeting, The Ohio State University, Columbus, May 31, 2013.

Amanda R. Panfil (PI: Patrick Green):
• 2013-2016 Mentor for T32 Cancer Genetics Training Grant Fellowship.

Ruby Pina (PI: Gireesh Rajashekara):
• OARDC professional growth scholarship program for CRWAD meet, December 8-10, 2013, Chicago, Illinois, USA.

Anastasia Purgianto (PI: Jianrong Li):
• Won Ohio Agricultural Research and Development Center (OARDC) Undergraduate Research Grant ($3,000)
• OSU SOLAR Undergraduate Research Grant Award

Annette Ratcliff, PhD (PI: Jesse Kwiek):
• Recipient of OSU Pelotonia Fellowship, 2012-present.

Smitha J. Sasindran (PI: Jordi Torrelles):
• 1st Place for the best poster presentation under the category of Research Staff. 5th Center for Microbial Interface Biology 2013 Retreat, April 18-19, 2013. Sasindran SJ, Arcos J, Diangelo L, Venigalla P, Silwani SH, Torrelles JB. “Role of human alveolar lining fluid in the host immune response to Mycobacterium tuberculosis infection.” The Ohio State University, Columbus, Ohio.

Kelly Scheuer (PI: Linda Saif):
• Accepted into the OSU College of Veterinary Medical College to become a veterinarian. 2013.

Suress de Silva, PhD Postdoctoral Researcher (PI: Li Wu):
• Winner of the first place of travel award for short talk presentation at the Research Retreat of the Center for Microbial Interface Biology, OSU, April 2013.

Patrick Sherwood, PhD candidate, (PI: Enrico Bonello):
• Charles E. Throne Memorial Associateship, PhD stipend funding of $22,000 from the Ohio Agricultural Research and Development Center (OARDC), Aug. 2013-Aug. 2014 (received March 2013).
• H.J. Dubin Student Travel Award to attend the 2013 Annual Meeting of the American Phytopathological Society.

**David Showalter, PhD candidate, (PI: Enrico Bonello):**

- College of Food, Agriculture, and Environmental Sciences Environmental Graduate Research Fellowship, Aug. 2013-Aug. 2014 (received March 2013).
- Plant Molecular Biology and Biotechnology Fellowship, 2011-2013.

**Chris Stahl (PI: Brian Ahmer):**

- Honorable mention at the Denman undergraduate research forum.

**Mia Tazi (PI: Amal Amer):**

- 2012 Immunology Round Table Travel Award for best Immunology Presentation.
- 2013-2014 Center for Microbial Interface Biology NIH Training Grant T32.
- 2013 Midwest Microbial Pathogenesis Travel Award.
- 2013 Biomedical Sciences Graduate Program retreat Oral Presentation Honorable Mention.

**Poornima Venigalla (PI: Jordi Torrelles):**

- 2013 Undergraduate Research Office (URO) Summer Fellowship (13 funded from 127 applications). “Receptor expression on immune cells in response to *Mycobacterium tuberculosis* exposed to human lung surfactant.”

**Paula Vivas, PhD (PI: Kristine Yoder):**

- American Heart Association Postdoctoral Fellowship.

**Dawn Walker (PI: Mark Drew):**

- Poster award, Midwest Neglected Diseases Conference, University of Notre Dame. August 2012.

**Cynthia Wu (PI: Joanne Turner):**

- 2012-2014 Systems and Integrated Biology Training Grant Fellowship.

**Yu Zhang, PhD (PI: Jianrong Li):**

- Won American Society for Virology Travel award in 2013.

**Yan Zhou, PhD (PI: Christopher Walker):**

- Outstanding Post-doctoral Scientist Award, The Research Institute at Nationwide Children’s Hospital.
APPENDIX D-3: Trainee Fellowships and Scholarships

Kyle Caution (PI: Amal Amer):
- Nomination for The Ohio State University Presidential Fellowship by Biomedical Science Graduate Program. 2012 and 2013.

Kshipra Chandrashekhar (PI: Gireesh Rajashekara):

Nicholas Chesarino (PI: Jacob Yount):
- OSU Systems and Integrated Biology Training Grant Fellowship, Sponsored by the NIH/NIGMS, T32GM068412.

Christina Durcholz (PI: Jesse Kwiek):
- Recipient of OSU Roessler 1-year Fellowship.

Santtu Heinonen, MD (PI: Asuncion Mejias):
- “Immunology of RSV infection in Children.” European Society for Infectious Diseases (ESPID) Fellowship Award. $40,000/year 2013-2015.

Julius Medardus (PI: Wondwossen Gebreyes):
- USAID iAGRI fellowship award.

Megan Mefford, PhD (PI: Jesse Kwiek):
- Recipient of CMIB T32 Fellowship. 2012-present

Juan Ignacio Moliva (PI: Jordi Torrelles):
- 2013 Recipient of the College of Medicine Systems and Integrative Biology (SIB) Training Program Fellowship. “Rethinking the BCG Vaccine: Role of the Lung Microenvironment.”

Bin Ni (PI: Larry Schlesinger):
- 2011 Deans Distinguished University Fellowship.

Amanda R. Panfil (PI: Patrick Green):

Charles Pyle (PI: Larry Schlesinger):
- T32 Training grant recipient. 2010-present.

Andrei Rajkovic (PI: Michael Ibba):
- Center for RNA Biology Fellow

Annette Ratcliff, PhD (PI: Jesse Kwiek):
- Recipient of OSU Pelotonia Fellowship. 2012-present.
Smitha J. Sasindran (PI: Jordi Torrelles):
- 1st Place for the best poster presentation under the category of Research Staff. Sasindran SJ, Arcos J, Diangelo L, Venigalla P, Silwani SH, Torrelles JB. “Role of human alveolar lining fluid in the host immune response to Mycobacterium tuberculosis infection.”

David Showalter (PI: Enrico Bonello):
- College of Food, Agriculture, and Environmental Sciences Environmental Graduate Research Fellowship, Aug. 2013-Aug. 2014 (received March 2013).
- Plant Molecular Biology and Biotechnology Fellowship, 2011-2013.

Poornima Venigalla (PI: Jordi Torrelles):
- 2013 Undergraduate Research Office (URO) Summer Fellowship. “Receptor Expression on immune cells in response to Mycobacterium tuberculosis exposed to human lung surfactant.”

Paula Vivas (PI: Kristine Yoder):
- American Heart Association Postdoctoral Fellowship.

Cynthia Wu (PI: Joanne Turner):
- Systems and Integrated Biology Training Grant Fellowship 2012-2014.
APPENDIX E: Invited National and International Lectureships

BRIAN AHMER

“Use of high-throughput parallel mutant screening to identify interspecies bacterial interactions.” Indiana University, April 2013.

AMAL AMER


“How caspases modulate bacterial infections.” Pathobiology, Molecular Medicine, Cleveland Clinic Lerner College of Medicine, Case Western Reserve University, USA. February 2013.


IRINA ARTSIMOVITCH

“RNA polymerase control through the secondary channel.” Symposium on Lead Structures of Cell Function, Bayreuth, Germany, July 2012.


“Control of gene expression by RfaH.” Nankai University, Tianjin, China, September 2012.


“Bridging transcription and translation.” Ohio State University, Department of Biochemistry, Columbus, Ohio, February 2013.


MICHAEL T. BAILEY


LAUREN BAKALETZ


“Biofilms can be dispersed by focusing the immune system on a common family of bacterial nucleoid associated proteins.” 6th ASM Conference on Biofilms, Miami, FL, September 29-October 4, 2012.

“Taking aim at biofilms to develop vaccines to prevent or treat chronic middle ear infections (otitis media).” National Institute on Deafness and Other Communication Disorders/National Institutes of Health Advisory Council Meeting, September 7, 2012.

BETH BESECKER

“Immunologic Impact of Zinc Status During Sepsis.” CMIB Annual Retreat – April 2013.


ENRICO BONELLO


PROSPER BOYAKA


“Innate regulation of immune responses to mucosal vaccines.” Brown University, Department of Molecular Microbiology and Immunology. April 20, 2013.

“Regulation of allergen-specific IgA and IL-17 responses by intestinal epithelial cell IKKβ reshapes allergic inflammation at distant sites.” Pennsylvania State University. June 6, 2013.

TOM CHERPES

“Effector function of peripheral T cells responding to ex vivo stimulation with chlamydial antigen.” XII International Congress of Reproductive Immunology (Boston, MA, June, 2013).

MARK DREW
“Antimalarial Drug Discovery.” University of Washington Tacoma, Department of Biology. May 2013.

JENNIFER EDWARDS

“Pilin post-translational modifications mediate Neisseria meningitidis adherence to the platelet activating factor receptor (PAFr) on human airway epithelia.” The Ohio Branch of the American Society for Microbiology Annual Meeting, Ashland, OH, April 2013.

WONDWOSSEN GEBREYES

Plenary speaker, Workshop on molecular epidemiology and diagnostics in production medicine. Trakia University, Stara Zagora, Bulgaria. December 2013.

Keynote speaker, Symposium on Food safety, Autonomous University of Mexico (UNAM), Mexico City, Mexico. March 9, 2013.

Plenary Keynote Speaker, XXI Latin America Microbiology Congress, Santos, Brazil. October 28-October 31, 2012.

RENUKARADHYA GOURAPURA


Gourapura GJ. “Immune response to swine influenza viruses in pigs.” Presented at Center for Microbial Interface Biology – Work in Progress, DHLRI, Columbus, United States. October 2012.

Gourapura GJ. “Nanotechnology based vaccine to protect pigs against porcine reproductive and respiratory syndrome.” Presented at CFAES, Technology Review Board, Annual Meeting, Kottman Hall, Columbus, Ohio, United States, November 2012.


Gourapura GJ. “Development and validation of an assay to detect porcine reproductive and respiratory syndrome virus specific neutralizing antibody titers in pig oral fluid samples.” 2013 International porcine reproductive and respiratory syndrome symposium, May 20-22, Beijing, China.


PATRICK GREEN

“HTLV-1 Transforming Genes; Tax vs Hbz.” Center for Microbial Interface Biology (CMIB), The Ohio State University, April 2013.

“The Role of the HTLV-1 Antisense Gene in Viral Pathogenesis.” University of California Davis, Davis, California, March 2013.

“HTLV-1 Transforming Genes: Tax vs Hbz.” NIH/NCI Frederick, MD, December 2012.


The Ohio State University, Department of Veterinary Biosciences, 2012.

“Molecular Pathogenesis Studies of Human T-cell Leukemia Virus.” The Ohio State University, Department of Veterinary Biosciences, September, 2012.

JOHN GUNN


7th International Conference on Tularemia, Sept. 2012. "Secretion of the acid phosphatase AcpA in vitro and in vivo."

4th ASM Conference on *Salmonella*: the Bacterium, the Host and the Environment, October 5 – 9, 2013, Boston, MA. “The Gallbladder Epithelium As A Secondary Niche For Chronic *Salmonella* Carriage.”

**DON HAYES JR.**


“Complications of Advanced Cystic Fibrosis.” Karolinska Institutet, Astrid Lindgren Children’s Hospital and Karolinska University Hospital, Departments of Pediatrics and Respiratory Medicine and Allergy, Stockholm Cystic Fibrosis Center, Stockholm, Sweden. May 2013.

**MICHAEL IBBA**


“Quality control and translation of the genetic code.” Department of Microbiology and Immunology, Thomas Jefferson University, PA. October 2012.

“Quality control and translation of the genetic code.” Department of Biochemistry, School of Medicine, University of Patras, Greece. June 2013.

“Quality control and translation of the genetic code.” Department of Molecular and Human Genetics, Baylor College of Medicine, TX. January 2013.

“Quality control and translation of the genetic code.” Department of Biochemistry & Biophysics, University of Rochester, NY. September 2012.

**SAM KING**

“Pneumococcal carbohydrate transporters: food for thought.” Department of Laboratory Medicine, Karolinska Institutet, Stockholm, Sweden. September 2012.

“Pneumococcal carbohydrate transporters: food for thought.” Institute of Microbiology and Infection, University of Birmingham, Birmingham, UK. September 2012.
“Pneumococcal carbohydrate transporters: food for thought.” Department of Biochemistry and Microbiology, University of Victoria, Victoria BC. October 2012.

“Pneumococcal carbohydrate transporters: food for thought.” Department of Biology, University of Indiana, Bloomington, Indiana. December 2012.


DAREN KNOELL


JESSE KWIEK


JIANRONG LI

“Messenger RNA processing in nonsegmented negative sense RNA viruses.” College of Animal Science, Zhejiang University, Hangzhou, China. 2013.

“Rational design of human metapneumovirus live attenuated vaccines by inhibiting mRNA cap methylation.” School of Public Health, University of Michigan, Ann Arbor, MI. 2013.


YUSEN LIU

“Glutathione reductase in immune defense against extracellular bacteria-A newly discovered trick of an old dog.” Presentation at Department of Chemistry, Ohio State University. May 21, 2013.

“Glutathione reductase and anti-microbial immune defense: A newly discovered trick of an old dog.” Seminar presentation at University of North Texas Health Science Center, Fort Worth, TX. October 14, 2013.

KEVIN MASON

“Mechanisms to Resist Antimicrobial Peptides and Nutritional Immunity Enhance Persistence of Nontypeable *Haemophilus influenzae* (NTHI).” University of California Davis, Department of Medical Microbiology and Immunology. February 1, 2013.

“Mechanisms to Resist Antimicrobial Peptides and Nutritional Immunity Enhance Persistence of Nontypeable *Haemophilus influenzae* (NTHI).” University of Texas, Southwestern Medical Center, Department of Microbiology. November 12, 2012.


“Mechanisms to Resist Antimicrobial Peptides and Nutritional Immunity Enhance Persistence of Nontypeable *Haemophilus influenzae* (NTHI).” Emory University, Department of Microbial and Molecular Genetics. October 15, 2012.


ASUNCION MEJIAS


Lounge and Learn Series: “Update on Respiratory Viruses.” Nationwide Children’s Hospital, Columbus, OH. March 22, 2013.

“Lower Respiratory Tract Infections in Children.” Pulmonary Integrated Pathway. The Ohio State University College of Medicine. April 30, 2013. Columbus, OH.

“Severity and Outcomes of Respiratory Viral Infections: Is it the Host, the Pathogen or both?” Pediatric Academy Society (PAS-SPR) annual meeting. May 5, 2013. Washington DC, MA.

“Pathogenesis and Severity of RSV infection.” College of Veterinary Medicine, The Ohio State University. May 14, 2013. Columbus, OH.


STEFAN NIEWIESK


ALISON NORRIS


ABIGAIL NORRIS-TURNER

“Infectious Disease Epidemiology and Global Health Research.” Kent State University, Department of Biostatistics, Environmental Health Sciences and Epidemiology, College of Public Health, Kent, OH, September 2013.

“Chlamydia, arrested immunity and HIV transmission dynamics.” University of California at Berkeley, Department of Epidemiology, Berkeley, CA, March 2013.

PREETI PANCHOLI

“The Microbiologist-Pharmacist Relationship: Married, Separated or Divorced?” Making a Difference in Infectious Diseases and Pharmacotherapy (MAD-ID); May 9, 2013; Florida.


MALDI-TOF Mass Spectrometry for Microbial Identification, SCACM Fall conference, October 1, 2012; Columbus, OH.

MALDI-TOF Mass Spectrometry: Cutting-Edge Microbial Identification, OSU Pathology Update Course; September 8, 2012), Columbus, OH).

VIJAY PANCHOLI

“Eukaryote-type Ser/Thr kinase (SP-STK) and phosphatase (SP-STP) reciprocally regulate carbohydrate metabolism of group A Streptococcus and its metabolic fitness in saliva.” 7th International Conference on Gram-Positive Microorganisms and 17th International Conference on Bacilli, Motecantini, Italy, June 24, 2013.


SANTIAGO PARTIDA-SANCHEZ
“Unexpected role of macrophages during pyelonephritis.” **Bench to Outcomes Seminar Series (BOSS).** The Research Institute at Nationwide Children’s Hospital, Columbus, OH, November 6, 2012.

“Functional role of CX3CR10hi inflammatory cells during urinary tract infection.” **Research Seminar Series.** Center for Microbial Interface Biology. The Ohio State University, Columbus, OH, April 15, 2013.

“Essential role for Ly6C+low non-classical monocyte-derived macrophages during urinary tract infections.” Invited lecture, The Unit for Biomedical Research, National Autonomous University of Mexico UNAM, Mexico City, Mexico, June 10, 2013.

“Functional role of TRPM2 ion channels during infection, inflammation and beyond.” **Immunology seminar series Mexican Association of Immunologists,** Mexico City, Mexico, June 12, 2013.

**MARK PEEPLES**

“RSV Re-Entry.” A keynote presentation at the 8th **International Respiratory Syncytial Virus Symposium** September 2012.

“Check-In Time for Respiratory Syncytial Virus at the Hotel Epithelium.” NIAID Respiratory Pathogens Research Center, University of Rochester Medical Center, Rochester, NY, February 2013.

“Respiratory Syncytial Virus at Check-In Time.” **Cellular and Molecular Seminar,** Cleveland State University, Cleveland, Ohio, April 2013.

**GIREESH RAJASHEKARA**

“In vivo Mucosal Transcriptome Responses to *Lactobacillus rhamnosus* and *Lactobacillus acidophilus* in a Neonatal Piglet Model.” **First Annual Meeting of the Infant Immunity Program,** Fernwood Building, 10401 Fernwood Road, 2nd Floor, Suite 2C-13-21-23, Bethesda, Maryland 20817 NIAID, NIH, DHHS. March 4-5, 2013.

“Can we tackle *Campylobacter*?” **OSUN/AS/HN Seminar series:** Autumn 2013. 0252 Campbell Hall. Novel approaches to control *Campylobacter*.

“In vivo Mucosal Transcriptome Responses to *Lactobacillus rhamnosus* and *Lactobacillus acidophilus* in a Neonatal Piglet Model.” **First Annual Meeting of the Infant Immunity Program,** March 4-5, 2013, Fernwood Building, 10401 Fernwood Road, 2nd Floor, Suite 2C-13-21-23, Bethesda, Maryland 20817 NIAID, NIH, DHHS.

**OCTAVIO RAMILO**

“RSV and Asthma: Myth or Reality.” Pediatrics Course, Clinical Las Condes, Santiago, Chile, July 2012.

“RSV the Year in Review.” Co-Chair, 10th **Global Expert Meeting in Respiratory Viruses,** Dusseldorf, Germany, September 2012.

“Rhinovirus: Beyond the common cold.” **Infectious Diseases Society of America Annual Meeting,** San Diego, CA, October 2012.


“RSV the Year in Review.” Co-Chair, Latin America Global Expert Meeting in Respiratory Viruses, Mexico, DF, Mexico, March 2013.


“RSV and Asthma: Myth or Reality?” 31st Annual Meeting of ESPID, Milano, Italy, June 2013.


CHAD RAPPLEYE


YASUKO RIKIHISA


“Ehrlichiae of Public Health and Veterinary Importance: Discovery of New Drugs. Invited Seminar.” College of Pharmacy, The Ohio State University, Columbus, OH. October 4, 2012.

LINDA SAIF

Invited Speaker, Infant Immunity Grantees Workshop and Meeting, NIH. Bethesda, MD, March 4-5, 2013.

Invited Speaker, SARS/MERS Coronavirus Symposium, NIH, Bethesda, MD, June 24, 2013.

Invited Speaker, Emerging Zoonotic Diseases symposium, NIH, Bethesda, MD June 25-26, 2013.


Invited Speaker: Coronavirus Natural History, MERS-CoV Research: Current Topics and Future Priorities NIH, Bethesda, MD. June 24, 2013.


“Strategies to improve efficacy in developing countries; prenatally acquired Vitamin A deficiency alters innate and antibody immune responses and reduces rotavirus vaccine efficacy in a gnotobiotic piglet model.” Intl. Congress of Pathogens at the Human-Animal Interface (ICOPHAI), Recife, Brazil. Aug 14-17, 2013.

“Impact of vitamin A deficiency and probiotics on vaccination and infection with rotavirus in the germ-free pig model.” Department of Veterinary Public Health & Food Safety Instituto Superiore di Sanita, Rome, Italy, September 4, 2013. Invited Lecturer.


YEHIA SAIF


LARRY SCHLESINGER


“Adaptive interplay of M. tuberculosis and the host during infection in the human respiratory system.” TB Retreat, Case Western Reserve University, December 7, 2012.

“Fine tuning inflammation at the front door: Macrophage complement receptor 3 mediates phagocytosis and immune suppression for Francisella tualrensis.” Department of Microbiology and Immunology. Indiana University School of Medicine. January 17, 2013.

“Immunoregulatory MicroRNAs and Tuberculosis.” Department of Microbiology and Immunology. Dartmouth-Hitchcock Medical Center, Hanover NH, April 29, 2013.


KURT STEVENSON


“Update on Antimicrobial Stewardship and Newer Antimicrobial Agents.” **Division of Hospital Medicine Grand Rounds**, The Ohio State University. December 11, 2012.


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**JORDI TORRELLES**


“Consuming Consumption: Influence of the alveolar environment in *Mycobacterium tuberculosis* pathogenesis.” Center for AIDS Research, February 28-March 1, 2013. **Case Western Reserve University**, University Hospital of Cleveland, Cleveland, OH, USA.

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**JOANNE TURNER**

“IL-10 deficiency reverses the TB susceptibility phenotype of CBA/J mice.” Invited. Case Western Reserve, **Department of pathology seminar series**. January 2013.


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**CHRISTOPHER WALKER**

“HCV PD-1/PD-L1 treatment in chimpanzees.” **Conference on Therapeutic Vaccination in Chronic Hepatitis B**. Essen Germany, June 28, 2013.
“Immunity and control of hepatitis C virus infection.” *Basel, Switzerland* (Roche), June 18, 2013.


**EASL-AASLD Special Conference on Therapy of Hepatitis C: Clinical application and drug development*. Prague, Czech Republic. September 14-16, 2012.


**SHU HUA-WANG**


**KARL WERBOVETZ**


**MARK WEWERS**


**CAROLINE WHITACRE**


“The Changing Research Landscape and Forging Partnerships with industry.” *Committee on Institutional Cooperation Research Partnership Meeting*, University of Iowa, Iowa City, IA. February 8, 2013.


DAN WOZNIAK

“Polysaccharides and biofilms of Pseudomonas aeruginosa.” Indiana University, Bloomington IN, Department of Microbiology and Immunology. 2012.

Dartmouth University, Dartmouth NH, Department of Microbiology and Immunology. 2012.

“Roles of Pseudomonas aeruginosa polysaccharides in biofilm development and pathogenesis.” Medimmune, Gaithersburg, MD, 2012.

“Polysaccharides and biofilms of Pseudomonas aeruginosa.” Institute of Microbiology, Chinese Academy of Science, Beijing, China. 2012.


“Roles of Pseudomonas aeruginosa polysaccharides in biofilm development and pathogenesis.” Pfizer, Boston, MA. 2012.

“Pseudomonas aeruginosa biofilm matrix exopolysaccharides.” Hannover, Germany. 2013.


“Pseudomonas biofilms and immunity.” Duquesne University, Department of Biology. 2013.

LI WU

The 19th Coast Retroviruses Meeting., Palm Springs, CA. October 4-6, 2012.

AHMED YOUSEF


JIAN ZHANG

“Regulation of naturally-occurring CD4+ CD25+ regulatory T cell development by E3 ubiquitin ligase Cbl-b.” AAI Block Symposium, May 7, 2013, Honolulu, Hawaii.

APPENDIX F: Abstracts

AMAL AMER


Rosales-Reyes R, Aubert DF, Tolman JS, Amer AO, Valvano MA. “Burkholderia cenocepacia type VI secretion system mediates escape of type II secreted proteins into the cytoplasm of infected macrophages.” PLOS One. PMCID: 34050077: e41726.


Amer AO. Pulmonary Infection. Published by In Tech 2012.

IRINA ARTSIMOVITCH


MICHAEL T. BAILEY

LAUREN BAKALETZ

Novotny LA, Stuller KA, Clements JD, Bakaletz LO. “Transcutaneous immunization with a patch resolves active experimental otitis media.” Abst. Skin Vaccination Summit 2013.


Stuller KA, Novotny LA, Clements JD, Bakaletz LO. “Transcutaneous immunization with a patch resolves active experimental otitis media.” Abst. Seventh Extraordinary International Symposium on Recent Advances in Otitis Media.


BETH BESECER


**ENRICO BONELLO**


PROSPER BOYAKA


MARK DREW


JENNIFER EDWARDS


EMILIO FLANO


MIKHAIL GAVRILIN


STEVEN GOODMAN

Devaraj A, Goodman SD, Justice SS. “Characterizing the role of IHF subunits in Uropathogenic E. coli (UPEC) biofilm structure and function.” Clinical and Scientific Advances in Urinary Tract Infections, Nationwide Children’s Hospital, Columbus, OH May 31-June 2, 2013.


Amer AO, Goodman SD, Bakaletz LO. “Biofilms can be dispersed by focusing the immune system on a common family of bacterial nucleoid associated proteins.” American Society for Microbiology Conference on Biofilms, Miami, FL, September 29-October 4, 2012.

RENUKARADHYA J. GOURAPURA


PATRICK GREEN


JOHN GUNN


Hoang K, Bachelder E, Borteh H, Rajaram MVS, Curry H, Ainslie K, Gunn JS, Schlesinger LS. “Use of Encapsulated AR-12 As A Host-Directed Agent to Control Intracellular Pathogens.” 2013 PHPID Annual Member Meeting, Columbus, Ohio. May 2013.


DON HAYES JR.


SHERYL JUSTICE

Szelestey BR, Raffel FK, Justice SS, Mason KM. “Transient heme-iron restriction primes altered biofilm architecture and enhanced fitness of nontypeable Haemophilus influenzae in vivo.” Research Day at the Research Institute at Nationwide Children’s. Columbus, Ohio.

Devaraj A, Justice SS, and Goodman SD. “Characterizing the role of IHF subunits in Uropathogenic Escherichia coli (UPEC) biofilm structure and function.” The Center for Microbial Interface Biology Research Retreat. Columbus, Ohio.


Kozlovich CE, Li B, Justice SS. “Reactive species produced by murine macrophages induce filamentation of uropathogenic *Escherichia coli.*” Midwest Microbial Pathogenesis Conference. Milwaukee, WI.


**SAM KING**


Lloyd AR, Singh AK, King SJ. “Identification of the region of pneumococcal protein BgaA that mediates adherence to human epithelial cells.” Poster presentation at the 12th Annual Ohio State University Wexner Medical Center Trainee Research Day, Columbus, Ohio. April 10-11, 2013.


Woodiga SA, Rohr JD, Buckwalter CM, Mahan JD, King SJ. “Identifying differences between pneumococcal strains that may contribute to development of hemolytic uremic syndrome.” Poster presentation at the Midwest Society for Pediatric Research, Annual Meeting, Columbus, Ohio October 4-5, 2012.

Lloyd AR, Singh AK, King SJ. “Identification of the region of pneumococcal protein BgaA that mediates adherence to human epithelial cells.” Poster presentation at the Midwest Society for Pediatric Research, Annual Meeting, Columbus, Ohio. October 4-5, 2012.


DAREN KNOELL


BENJAMIN KOPP


JESSE KWIEK


Geraghty SR, McNamara KA, Dillon CE, Hogan JS, Kwiek JJ, Keim SA. “Buying Human Milk Via the Internet: Just a Click Away.” Breastfeeding Medicine. 18th Annual International meeting of the Academy of Breastfeeding Medicine, November 2013, Philadelphia, PA. Platform presentation by SRG.
JEFFREY LAKRITZ


JIANRONG LI


YUSEN LIU


AMY LOVETT-RACKE


KEVIN MASON

Raffel FK, Szelestey BR, Beatty WL, Mason KM. “Nontypeable Haemophilus influenzae utilizes Sap transporter function to sense microenvironmental cues and enhance survival in the host.” Center for Microbial Interface Biology Meeting, The Ohio State University Medical Center, Columbus, Ohio. 2013.

Heimlich DR, Szelestey BR, Raffel FK, Justice SS, Mason KM. “Transient heme-iron restriction perpetuates enhanced biofilm architecture that influences persistence of nontypeable Haemophilus influenzae and disease severity.” Center for Microbial Interface Biology Meeting, The Ohio State University Medical Center, Columbus, Ohio. 2013.


BRADFORD MCGWIRE


ASUNCION MEJIAS


ROBERT MUNSON


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