

2009-2010
Summary of Scholarly Activities
Department of Microbiology and Immunology

I. PUBLISHED JOURNAL ARTICLES, BOOK CHAPTERS, AND PATENTS

Burtnick MN, DeShazer D, Nair V, Gherardini FC, Brett PJ. *Burkholderia mallei*. Cluster I type VI secretion mutants exhibit growth and actin-motility and defects in RAW 264.7 murine macrophages. Infect Immun 2010 Jan;78(1):88-99.

Coggin JH Jr, Rohrer JW, Barsoum AL, inventors; South Alabama Medical Science Foundation, assignees. Cancer vaccines containing epitopes of oncofetal antigen. US patent 7,718,762 B2. 2010 May 18.

Coggin JH, Barsoum AL, Rohrer JW, inventors; South Alabama Medical Science Foundation, assignees. Uses of oncofetal antigen specific CD4, CD8 cytotoxic and suppressor T cells and interleukin-10. European Union patent EP0939796B1. 2010 Apr 6.

Frohlich KM, Roberts RAW, Housley NA, Audia JP. *Rickettsia prowazekii* uses a sn-glycerol-3-phosphate dehydrogenase and a novel dihydroxyacetone phosphate transport system to supply triose phosphate for phospholipid biosynthesis. J Bacteriol 2010 Sep;192(17):4281-8.

Galyov EE, Brett PJ, DeShazer D. Molecular insights into *Burkholderia pseudomallei* and *Burkholderia mallei* pathogenesis. Ann Rev Microbiol 2010 Sep;64:495-517.

II. PUBLISHED ABSTRACTS

III. PUBLISHED BOOKS

IV. INVITED PRESENTATIONS

Audia JP. Invited speaker. The kid in the candy store: what can an obligate intracellular bacterium teach us about metabolism and reductive evolution? Center for Biopreparedness and Infectious Disease, The Medical College of Wisconsin; 2009 Nov 13; Milwaukee, WI.

Brett PJ. Invited speaker. Interactions of *Burkholderia pseudomallei* with murine macrophages. Ninety-Fifth Annual ASM Southeastern Branch Conference; 2009 Nov 6; Savannah, GA.

Brett PJ. Invited speaker. Interactions of *Burkholderia mallei* with murine macrophages. University of Georgia; 2010 Apr 28; Athens, GA.

Burtnick MN. Invited speaker. The VirAG regulon plays a critical role in the intracellular lifestyle of *Burkholderia mallei*. Ninety-Fifth Annual ASM Southeastern Branch Conference; 2009 Nov 7; Savannah, GA.

Foster JW. Invited speaker. Acid food fight: mechanisms and regulation of *E. coli* acid resistance. Asian Pacific Symposium on Food Safety; 2009 Nov 11-13; Seoul, Korea.

Foster JW. Invited speaker. *E. coli* acid resistance: what's a tRNA modification enzyme doing in my regulatory soup? Society for General Microbiology, University of Nottingham; 2010 Sep 6; Nottingham, England.

Wood DO. Invited speaker. *Rickettsia prowazekii*: exploring obligate intracellular growth gene by gene. Department of Pathobiological Sciences, School of Veterinary Medicine, Louisiana State University; 2010 Apr 15; Baton Rouge, LA.

V. NATIONAL PROFESSIONAL RECOGNITION

Dr. Jonathon P. Audia is Review Editor for *Frontiers in Cellular and Infection Microbiology*.

Dr. Robert A. Barrington is Review Editor for *Frontiers in B Cell Biology* and Ad hoc reviewer for the *Journal of Immunology* and *European Journal of Immunology*.

Dr. Paul J. Brett is ad hoc Reviewer for the journals of *Molecular Microbiology*, *Infection and Immunity*, *Journal of Bacteriology*, *Clinical and Vaccine Immunology*, *Applied and Environmental Microbiology*, and *Journal of Clinical Microbiology*. He also served as ad hoc grant reviewer for the Defense Threat Reduction Agency (DTRA) Chemical and Biological Defense Program, and the American Heart Association (AHA). Dr. Brett is a subject matter expert for National Biodefense Analysis and Countermeasures Center-Department of Homeland Security Bioterrorism Threat Risk Assessment review. Review panel member for Joint Science and Technology Office for Chemical and Biological Defense, Basic and Supporting Sciences Division, Medical Basic Research Capability Area for fiscal year 2010 science review. Review panel member for Joint Science and Technology Office for Chemical and Biological Defense, Basic and Supporting Sciences Division, Medical Basic Research Capability Area, for fiscal year 2009 science review.

Dr. Joseph W. Brewer served as a reviewer for the National Science Foundation Graduate Research Fellowship Program: Microbiology and Cell Biology Panel.

He served as a peer reviewer of grant proposals for the American Heart Association, Region 4, Spring Immunology and Virology Review Committee for Fall and Spring cycle and as an ad hoc reviewer for National Science Foundation.

Dr. Mary N. Burtnick served as ad hoc reviewer for *BMC Microbiology*, the Defense Threat Reduction Agency (DTRA), joint Science and Technology Office for Chemical and Biological Defense Basic and Supporting Sciences Division (JSTO-CBD) Program, and Medical Basic Research (MBR) Capability Areas for fiscal year 2009 and 2010 science review. Dr. Burtnick is a subject matter expert to the National Biodefense Analysis and Countermeasure Center-Homeland Security Bioterrorism Risk Assessment Review.

Dr. John W. Foster served as a reviewer for the *Journal of Bacteriology*, *Molecular Microbiology*, *Journal of Molecular Biology*, *Applied and Environmental Microbiology*, and *FEMS Microbiology*. He also served as Subsection Editor for *Escherichia coli/Salmonella Cellular and Molecular Biology*, ASM Press.

Dr. John E. Oakes is Primary Reviewer for *Journal of Immunology* and ad hoc Reviewer for *Investigative Ophthalmology and Visual Sciences*.

Dr. David O. Wood is Chair, American Society for Microbiology Membership Committee and a member of the ASM Committee on Ethics. He also serves on the editorial board of *Infection and Immunity*. Dr. Wood is a member of the Association of Microbiology and Immunology chairs. He is an ad hoc reviewer for *Journal of Bacteriology* and the *Journal of Applied and Environmental Microbiology*.

VI. BRIEF SUMMARY OF ACTIVITIES AND PROGRESS

Two Microbiology and Immunology students received their Ph.D. degree this year. Dr. Jessica Lynn Jones completed her graduate work with Dr. Foster in the department on October 13, 2009. Dr. Jones is working as a Microbiologist with the USFDA Gulf Coast Seafood Laboratory, Dauphin Island, Alabama. Dr. Kyla Marie Frohlich completed her graduate work with Dr. Audia in the department on October 27, 2009. Dr. Frohlich is currently a Post Doctoral Fellow at Louisiana State University Health Sciences Center in the Department of Microbiology, Immunology and Parasitology.

Drs. David Wood, Audia, Brett, and Burtnick submitted a proposal for an ARRA C06 grant. The grant was awarded in January and provides \$14,506,327 for the construction of a 25,800 square foot building to replace the Laboratory of Molecular Biology Building. The schematic phase of the C06 – Laboratory of Infectious Diseases (LID) project is completed and is currently in the design phase. Renovation of departmental research and office space on the second floor of the Medical Science Building was also completed this year.

The Department's active research programs remain a major focus of faculty activities. These include research on the obligate intracellular bacterium, *Rickettsia prowazekii*, by Drs. Audia, Winkler, and Wood, studies on the unfolded protein response by Dr. Brewer, and research on the physiology and genetics of enteric pathogens by Dr. John Foster. Dr. Brewer was awarded tenure this year.

Dr. Barrington continues to focus on examining the environmental and genetic components regulating B cell fate while Dr. Brett and Dr. Burtnick continue their investigations of the molecular mechanisms by which *Burkholderia pseudomallei* and *Burkholderia mallei* subvert host innate immune disease. Dr. Rohrer continues to investigate the role of a unique oncofetal immunogen (OFA).

The department is committed to excellence in teaching. All faculty members participate in the Medical Microbiology and Immunology course MIC 211/MIC 530 as well as in the interdisciplinary graduate courses IDL 580 and IDL 581. Several faculty and students also participate in the DREAM program. The department continues to conduct a hands-on medical microbiology laboratory directed by Dr. Foster and is, in addition to standard lectures, incorporating case studies and correlations presented by our clinical colleagues. The laboratory component of Medical Microbiology and Immunology exposes the students to wet lab unknowns and small group interactions. "Clickers" were incorporated into lectures by several of the Faculty. It is anticipated that this will expand.

The Department hosted two scientists for the Distinguished Scientist Seminar Series who presented outstanding seminars and met with the departmental faculty and students. Dr. John F. Kearney, from the University of Alabama at Birmingham, Department of Microbiology, Division of Developmental and Clinical Immunology presented a seminar entitled "Determination of the Primary B cell Repertoire and Disease Associations." Dr. David DeShazer a microbiologist from the Bacteriology Division, U.S. Army Medical Research Institute of Infectious Diseases presented a seminar entitled "Type VI secretion systems in the category B select agent *Burkholderia pseudomallei*."

Dr. Barrington sponsored medical student Austin Fox and with Dr. Brewer co-sponsored medical student Nick Bates as part of the Summer Medical Student Research Program. Dr. Barrington and Dr. Brewer also sponsored undergraduate summer student Paige Perry as part of the UCUR program.

Dr. Wood, Dr. Brewer, and Dr. Barrington, participated in an *ad hoc* committee assembled by the Dean to make recommendations regarding the purchase of new flow cytometry equipment and the formation of an expanded flow cytometry core facility for the COM.

Dr. Barrington, Dr. Brewer, Dr. Lin, and Dr. Cioffi formed the Host Defense and Human Disease Research Group.

The main objective of this group is to foster an interdisciplinary approach to understanding how host defense mechanisms affect human disease.

As an effort to encourage future scientists and clinicians, Dr. Brewer and Dr. Barrington hosted 8th grade science students from Faith Academy for a Future Scientists and Clinicians laboratory tour and talk, February 18, 2010.

Dr. Foster was an external examiner in the Swarthmore College Honors program and the External Reviewer for Tao Dong, Ph.D. Candidate, McMaster University, Hamilton, Ontario, Canada, March 2010. Dr. Foster presented at Surgery Grand Rounds, USA Medical Center, Dec. 18 2009 a seminar, "Pathogenesis of intestinal and extraintestinal *Escherichia coli* infections." He is also completing the 2nd edition of his textbook *Microbiology:an Evolving Science* (Coauthored by Joan Slonczewski) and has started work on a new microbiology textbook designed for allied health science students. His work on the acid resistance of enteric pathogens continues with new focus into the virulence plasmid of *Shigella* and continued investigations of *E. coli* pathovars.

Dr. Rohrer in his role as one of the lead scientists in the OFA clinical trial prepares vaccine for the FDA-approved trial that is testing the safety and efficacy of oncofetal antigen-loaded, autologous, mature monocyte-derived dendritic cell vaccine for immunotherapy of metastatic breast cancer.

Dr. John E. Oakes served as course director for the Medical Microbiology and Immunology, Advanced Virology, Advanced Immunology, and the DREAM program. Dr. Oakes will retire January 1, 2011 after 32 years at the University of South Alabama.

Dr. Herbert H. Winkler, Louise Lenore Locke Distinguished Professor of Microbiology and Immunology will retire September 30th after 32 years at the University of South Alabama.