

2010-2011
Summary of Scholarly Activities
Department of Microbiology and Immunology

I. PUBLISHED JOURNAL ARTICLES, BOOK CHAPTERS, AND PATENTS

Brett PJ, Burtnick MN, Heiss C, Azadi P, DeShazer D, Woods DE, Gherardini FC. *Burkholderia thailandensis oacA* mutants facilitate the expression of *Burkholderia mallei*-like O polysaccharides. *Infect Immun*. 2011 Feb;79(2):961-9.

Burtnick MN, Brett PJ, Harding SV, Ngugi SA, Ribot WJ, Chantratita N, Scorpio A, Milne TS, Dean RE, Fritz DL, Peacock SJ, Prior JL, Atkins TP, Deshazer D. The cluster 1 type VI secretion system is a major virulence determinant in *Burkholderia pseudomallei*. *Infect Immun*. 2011 Apr;79(4):1512-25.

Clark TR, Lackey AM, Kleba B, Driskell LO, Lutter EI, Martens C, Wood DO, Hackstadt T. Transformation frequency of a mariner-based transposon in *Rickettsia rickettsii*. *J Bacteriol*. 2011 Sep;193(18):4993-5.

Housley NA, Winkler HH, Audia JP. The *Rickettsia prowazekii* ExoU homologue possesses phospholipase A₁ (PLA₁), PLA₂, and Lyso-PLA₂ activities and can function in the absence of any eukaryotic cofactors in vitro. *J Bacteriol*. 2011 Sep;193(18):4634-42.

Nuti DE, Crump RB, Dwi Handayani F, Chantratita N, Peacock SJ, Bowen R, Feigner PL, Huw Davies D, Wu T, Lyons CR, Brett PJ, Burtnick MN, Kozel TR, Aucoin DP. Identification of circulating bacterial antigens by in vivo microbial antigen discovery. *MBio*. 2011 Aug 16;2(4):e00136-11. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3163937/pdf/mBio.00136-11.pdf>

Tucker AM, Driskell LO, Pannell LK, Wood DO. Differential proteomic analysis of *Rickettsia prowazekii* propagated in diverse host backgrounds. *Appl Environ Microbiol*. 2011 Jul;77(14):4712-8.

Woodard A, Wood DO. Analysis of convergent gene transcripts in the obligate intracellular bacterium *Rickettsia prowazekii*. *PLoS ONE*. 2011 Jan 26;6(1):e16537. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3027695/pdf/pone.0016537.pdf>

II. PUBLISHED ABSTRACTS

Burtnick MN, Gherardini FC, Brett PJ. OacA is required for the 4-O-Acetylation of *Burkholderia pseudomallei* and *Burkholderia thailandensis* O-Polysaccharides. 6th World Melioidosis Congress; 2010 Dec 2; Townsville, QLD, Australia. Abstract no. P57.

Burtnick MN, Gherardini FC, Brett PJ. *Burkholderia pseudomallei* type III secretion mutants differentially activate RAW 264.7 macrophages. 6th World Melioidosis Congress; 2010 Dec 2; Townsville, QLD, Australia. Abstract no. P88.

Burtnick MN, Rocker JM, Pannell LK, Deshazer D, Brett PJ. Molecular characterization of a virulence-associated type VI secretion system expressed by *Burkholderia thailandensis*. 111th General Meeting of the American Society for Microbiology; 2011 May 24; New Orleans, LA. Abstract no. 2523. Available from: <http://www.abstractsonline.com/Plan/AuthorIndex.aspx>

Burtnick MN, Gherardini FC, Brett PJ. *Burkholderia pseudomallei* Cluster 2 and 3 type III secretion systems are required for optimal activation of RAW 264.7 cells. 111th General Meeting of the American Society for Microbiology; 2011 May 24; New Orleans, LA. Abstract no. 2524. Available from: <http://www.abstractsonline.com/Plan/AuthorIndex.aspx>

Byrd AE, Brewer JW. MicroRNA-mediated repression of XBP1: a novel mechanism for regulation of a UPR transcriptional activator. J Immunol. 2011 Apr 1;186:62.15. Available from: http://www.jimmunol.org/content/vol186/1_MeetingAbstracts

DeShazer D, Burtnick MN, Brett PJ, Harding SV, Ngugi S, Ribot WJ, Chantratita N, Scorpio A, Milne TS, Dean R, Fritz DL, Peacock SJ, Prior JL, Atkins TP. The cluster 1 type VI secretion system is a major virulence determinant in *Burkholderia pseudomallei*. 6th World Melioidosis Congress; 2010 Dec 2; Townsville, QLD, Australia. Abstract no. P133.

Housley NA, Audia JP. The *Rickettsia prowazekii* ExoU homologue possesses phospholipase A₁ (PLA₁), PLA₂, and lyso-PLA₂ activities and can function in the absence of any eukaryotic co-factors *in vitro*. 111th General Meeting of the American Society for Microbiology; 2011 May 24; New Orleans, LA. Abstract no. 2279. Available from: <http://www.abstractsonline.com/Plan/AuthorIndex.aspx>

Lackey AM, Wood DO. Interaction of *Rickettsia prowazekii* with an integral component of the autophagic system. 111th General Meeting of the American Society for Microbiology. 111th General Meeting of the American Society for Microbiology; 2011 May 24; New Orleans, LA. Abstract no. 131. Available from: <http://www.abstractsonline.com/Plan/AuthorIndex.aspx>

Wood DO, Hines A, Woodard A, Tucker AM, Driskell LO, Burkhardt NY, Baldrige GD, Munderloh UG. Transformation of *Rickettsia prowazekii* with a Rickettsial shuttle vector. 111th General Meeting of the American Society for Microbiology; 2011 May 24; New Orleans, LA. Abstract no. 1570. Available from: <http://www.abstractsonline.com/Plan/AuthorIndex.aspx>

III. PUBLISHED BOOKS

Slonczewski JL, Foster JW. Microbiology, an evolving science. 2011. 2nd ed. New York: WW Norton Publishing; 2011, 1097 p.

IV. INVITED PRESENTATIONS

Brett PJ. Invited speaker. Development of glycoconjugate vaccines for immunization against melioidosis and glanders. Department of Homeland Security-sponsored *Burkholderia* Workshop, Northern Arizona University; 2011 Jul 27; Flagstaff, AZ.

Brewer JW. Invited speaker. Unraveling the unfolded protein response of antibody-secreting B cells. Department of Cell Biology, University of Alabama at Birmingham, School of Medicine; 2011 Jan 5; Birmingham, AL.

Burtnick MN. Invited speaker. Interactions of *Burkholderia pseudomallei* type III secretion mutants with host cells. PSWRCE/RMRCE-sponsored *Burkholderia* Workshop, University of California; 2011 Mar 14; Los Angeles, CA.

Burtnick MN. Invited speaker. Interactions of *Burkholderia mallei* and *Burkholderia pseudomallei* with host cells. Department of Homeland Security-sponsored *Burkholderia* Workshop, Northern Arizona University; 2011 Jul 27; Flagstaff, AZ.

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 *The American Journal of Pathology*, *Antimicrobial Agents and Chemotherapy*, *Applied and Environmental Microbiology*, *BMC Microbiology*, *Central European Journal of Biology*, *Clinical and Vaccine Immunology*, *FEMS Immunology* and *Medical Microbiology*, *Frontiers in Cellular and Infection Microbiology*, *Infection and Immunity*, *Journal of Bacteriology*, *Journal of Clinical Microbiology*, *Journal of Proteome Research*, *Microbiology*, *Molecular Microbiology*, *PLoS Neglected Tropical Diseases*, *PLoS Pathogens*, and *Proteomics*. He also serves as panel member for the 4th Annual National Institutes of Health Career Symposium - Faculty Careers in Research-Intensive Schools, Ad hoc peer reviewer Medical Research Council, United Kingdom - Infections and Immunity Board t-IIB and review panel member for NIAID/NIH "Partnerships for Biodefense (RFA-AI-10-003)" and NIAID/NIH "Protective Immunity in Special Populations (BAA-NIHAI2010085)."

Dr. Joseph W. Brewer served as a Reviewer for the National Science Foundation Graduate Research Fellowship Program: Microbiology and Cell Biology Panel, February 11 - 13, 2011. He served as an ad hoc grant reviewer for the Comitato Telethon Fondazione, Italy, Spring 2011. He served as an ad hoc reviewer for *EMBO J.*, *International Immunology* and *Cancer Research*.

Dr. Mary N. Burtnick served as ad hoc reviewer for *Protein Expression and Purification*, *Journal of Bacteriology*, *Clinical Vaccine and Immunology*, *Frontiers in Cellular and Infection Microbiology*.

Dr. John W. Foster served as a Reviewer for *Science*, *Nucleic Acids Research*, *Journal of Bacteriology*, *Molecular Microbiology*, *Chemical and Engineering News*, and *Microbiology and Immunology*.

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*. Review Editor – *Frontiers in Cellular and Infection Microbiology*.

VI. BRIEF SUMMARY OF ACTIVITIES AND PROGRESS

Drs. Audia, Brett, Burtnick, and Wood continue contributing to preconstruction plan development for the C06 grant that will provide \$14,506,327 for the construction of a 25,800 square foot building to replace the Laboratory of Molecular Biology Building. The Final Record Set (FRD) documents for the C06 – Laboratory of Infectious Diseases (LID) project are scheduled to be completed by September 30, 2011.

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, 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. 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 conducted a hands-on medical

microbiology laboratory in the Fall of 2010, but will transition in 2011 to a Team-based Learning (TBL) approach that incorporates case studies and correlations presented by our clinical colleagues as well as “clicker” evaluations. The new course contains student-interactive Wiki and Blog sites where students post self-directed content and discuss infectious disease cases.

The Department hosted three scientists for the Distinguished Scientist Seminar Series who presented outstanding seminars and met with the departmental faculty and students. Thomas L. Rothstein, M.D., Ph.D. a Professor of Molecular Biology Medicine from the Feinstein Institute for Medical Research, Hofstra University School of Medicine, Hempstead, New York presented a seminar entitled “Natural antibody-producing B1 cells: From mouse to human and back again.” Andres Vazques-Torres, D.V.M., Ph.D. an Associate Professor of Department of Microbiology from the University of Colorado, Denver presented a seminar entitled “Adaptive tolerance to antibiotics through the nitrosylation of quiniol cytochrome oxidases.” Mark Coggeshall, Ph.D. a Robert S. Kerr Foundation Chair in cancer from the Oklahoma Medical Research Foundation Immunology and Cancer Program presented a seminar entitled, “Long and short term inflammation: causes and effects in a murine lupus model and in human *Bacillus anthracis* infection.”

Dr. Jarrod R. Fortwendel, Assistant Professor, joined the Department of Microbiology and Immunology faculty in August 2011. Dr. Fortwendel received his Ph.D. in Pathobiology and Molecular Medicine in 2005 from the University of Cincinnati. He completed his postdoctoral studies at the University of Cincinnati and at Duke University in Durham, NC.

Dr. John E. Oakes retired January 1, 2011 after 32 years in the Department of Microbiology and Immunology at the University of South Alabama. Dr. Oakes is currently Emeritus Professor in the Department of Microbiology and Immunology.