

Jessica L. Bradshaw, Ph.D.

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EDUCATION

Ph.D. in Microbiology and Immunology, May 2018

University of Mississippi Medical Center, Jackson, Mississippi, USA

Dissertation Title: "Mechanisms Enhancing Persistence and Virulence of *Streptococcus pneumoniae*: Impact on Mucosal Infections and Invasive Potential"

Advisor: Dr. Larry S. McDaniel, Ph.D.

B.S. in Microbiology/Cell and Molecular Biology, May 2013

Oklahoma State University, Stillwater, Oklahoma, USA

PROFESSIONAL EXPERIENCE

- 2018-present Postdoctoral Fellow, Department of Physiology and Biophysics
University of Mississippi Medical Center, Jackson, MS, USA
- Conduct primary research in hypertension and cardiorenal diseases
 - Monitor laboratory animals and perform animal surgeries
 - Train and mentor undergraduate students and rotating professional students
- 2013-2018 Graduate Assistant, Department of Microbiology and Immunology
University of Mississippi Medical Center, Jackson, MS, USA
- Conduct primary research in bacteriology and immunology
 - Present research at local, regional, and national conferences
 - Contribute to research collaborations
 - Monitor laboratory animals and perform animal infections
 - Train and mentor undergraduate students and rotating professional students
 - Assist with medical microbiology labs and simulations
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HONORS AND AWARDS

- 2018 Randall-Trustmark outstanding graduate research award
- 2018 First place graduate oral presentation, Health Sciences Division, MAS Annual Meeting, Hattiesburg, MS, USA
- 2017 Poster presentation award, UMMC SGSHS Research Day
- 2017 Third place graduate oral presentation, Health Sciences Division, MAS Annual Meeting, Hattiesburg, MS, USA
- 2017 Fourth place poster presentation, 2017 Mississippi INBRE Graduate Scholar Symposium, MAS Annual Meeting, Hattiesburg, MS, USA
- 2017 Mississippi INBRE Graduate Scholar
- 2014 Induction into University of Mississippi Chapter of Phi Kappa Phi Honor Society
- 2013-2018 Dean's Graduate Student Scholarship, University of Mississippi Medical Center
- 2011-2013 President's Honor Roll, Oklahoma State University
- 2011 Dean's Honor Roll, Oklahoma State University

JOURNAL PUBLICATIONS

1. Martin CS, **Bradshaw JL**, Pipkins HR, McDaniel LS. 2018. Pulmonary Disease Associated with Nonencapsulated *Streptococcus pneumoniae*. *Open Forum Infect Dis*. doi: 0.1093/ofid/ofy135.
2. **Bradshaw JL**, Caballero AR, Bierdeman MA, Adams KV, Pipkins HR, Tang A, O'Callaghan RJ, McDaniel LS. 2018. *Pseudomonas* Protease IV Exacerbates Pneumococcal Pneumonia and Invasive Disease. *mSphere* 3:e00212-18. doi:10.1128/mSphere.00212-18. PMID: 29720526. PMCID: PMC5932373.
3. Pipkins HR, **Bradshaw JL**, Keller LE, McDaniel LS. 2018. Virulence of Encapsulated *Streptococcus pneumoniae* Is Increased Upon Expression of Pneumococcal Surface Protein K. *J Infect Dis* 2018:1-8. doi:10.1093/infdis/jiy058. PMID:29394357.
4. **Bradshaw JL**, Pipkins HR, Keller LE, Pendarvis JK, McDaniel LS. 2018. Mucosal Infections and Invasive Potential of Nonencapsulated *Streptococcus pneumoniae* Are Enhanced by Oligopeptide Binding Proteins AliC and AliD. *mBio* 9:e02097-17. doi:10.1128/mBio.02097-17. PMID:29339428. PMCID: 5770551.
5. Pipkins HR, **Bradshaw JL**, Keller LE, Swiatlo E, McDaniel LS. 2017. Polyamine Transporter potABCD Is Required for Virulence in Encapsulated but Not Nonencapsulated *Streptococcus pneumoniae*. *PLoS One* 12(6):e0179159. doi:10.1371/journal.pone.0179159. PMID:28586394. PMCID: PMC5460881.
6. Keller LE, **Bradshaw JL**, Pipkins H, McDaniel LS. 2016. Surface Proteins and Pneumolysin of Encapsulated and Nonencapsulated *Streptococcus pneumoniae* Mediate Virulence in A Chinchilla Model of Otitis Media. *Front Cell Infect Microbiol* 6:55. doi:10.3389/fcimb.2016.00055. PMID:27242973. PMCID: PMC4870244.
7. Dixit C, Keller LE, **Bradshaw JL**, Robinson DA, Swiatlo E, McDaniel LS. 2016. Nonencapsulated *Streptococcus pneumoniae* as A Cause of Chronic Adenoiditis. *IDCases* 4:56-58. doi:10.1016/j.idcr.2016.04.001. PMID:27144125. PMCID: PMC4840421.

MANUSCRIPTS IN PREPARATION

1. **Bradshaw JL**, McDaniel LS. Selective Pressure: Rise of the Nonencapsulated Pneumococcus. Anticipated submission to *PLoS Pathogens* (invited review) in October 2018.
2. **Bradshaw JL**, Rafiqullah IM, McDaniel LS. Transformation of Nonencapsulated *Streptococcus pneumoniae* During Systemic Infection. Anticipated submission to *Sci Rep* in November 2018.
3. **Bradshaw JL**, Pipkins HR, McDaniel LS. Host Complement Factor C1q is Essential for Restraining Pathogenicity of Nonencapsulated *Streptococcus pneumoniae* Infections Mediated by Surface Adhesin CbpAC. Submission anticipated in January 2019, and journal is to be determined.

ABSTRACTS (* denotes oral presentation)

1. **Bradshaw JL***, Pipkins HR, McDaniel LS. Oligopeptide Binding Proteins AliC and AliD Alter Protein Expression and Mediate Virulence of Nonencapsulated *Streptococcus pneumoniae*. 2018 Southeastern Pneumococcal Symposium, Memphis, TN, USA.
2. Pipkins HR, **Bradshaw JL**, Keller LE, McDaniel LS. Virulence of Encapsulated *Streptococcus pneumoniae* Is Increased Upon Expression of Pneumococcal Surface Protein K. 2018 Southeastern Pneumococcal Symposium, Memphis, TN, USA.
3. Martin C, **Bradshaw JL**, Pipkins HR, McDaniel LS. Prevalence and Associated Virulence of Nonencapsulated *Streptococcus pneumoniae*. 2018 MAS General Meeting, Hattiesburg, MS, USA.
4. Pipkins HR, **Bradshaw JL**, Keller LE, McDaniel LS. Virulence of Encapsulated *Streptococcus pneumoniae* Is Increased Upon Expression of Pneumococcal Surface Protein K. 2018 MAS General Meeting, Hattiesburg, MS, USA.
5. **Bradshaw JL***, Pipkins HR, McDaniel LS. Oligopeptide Binding Proteins AliC and AliD Alter Protein Expression and Mediate Virulence of Nonencapsulated *Streptococcus pneumoniae*. 2018 MAS General Meeting, Hattiesburg, MS, USA.

6. Pipkins HR, **Bradshaw JL**, Keller LE, McDaniel LS. PspK Increases Virulence of Encapsulated *Streptococcus pneumoniae*. 2017 SGSHS Research Day, UMMC, Jackson, MS, USA.
7. **Bradshaw JL**, Pipkins HR, and McDaniel LS. Oligopeptide Binding Proteins AliC and AliD Alter Protein Expression and Mediate Virulence of Nonencapsulated *Streptococcus pneumoniae*. 2017 SGSHS Research Day, UMMC, Jackson, MS, USA.
8. **Bradshaw JL**, Pipkins HR, and McDaniel LS. Oligopeptide Binding Proteins AliC and AliD Alter Protein Expression and Mediate Virulence of Nonencapsulated *Streptococcus pneumoniae*. 2017 ASM Microbe, New Orleans, LA, USA.
9. HR Pipkins, **Bradshaw JL**, Keller LE, Swiatlo E, and McDaniel LS. Polyamine Transport Differentially Affects Virulence of Encapsulated and Nonencapsulated *Streptococcus pneumoniae*. 2017 ASM Microbe, New Orleans, LA, USA.
10. **Bradshaw JL***, Pipkins HR, Keller LE, Pendarvis JK, and McDaniel LS. Oligopeptide Binding Proteins AliC and AliD Intensify Virulence of Nonencapsulated *Streptococcus pneumoniae*. 2017 MAS General Meeting, Hattiesburg, MS, USA.
11. HR Pipkins, Keller LE, **Bradshaw JL**, and McDaniel LS. PspK Increases Virulence of Encapsulated *Streptococcus pneumoniae*. 2017 MAS General Meeting, Hattiesburg, MS, USA.
12. **Bradshaw JL***, Pipkins HR, Keller LE, Pendarvis JK, and McDaniel LS. Oligopeptide Binding Proteins AliC and AliD of Nonencapsulated *Streptococcus pneumoniae* Facilitate Mucosal Infections and Mediate Persistence during Invasive Disease. 2016 ASM South Central Branch Meeting, Lafayette, LA, USA.
13. Pipkins HR, Keller LE, **Bradshaw JL**, and McDaniel LS. Expression of the Nonencapsulated Virulence Protein PspK in Encapsulated *Streptococcus pneumoniae*. 2016 ASM South Central Branch Meeting, Lafayette, LA, USA.
14. **Bradshaw JL**, Keller LE, Pipkins HR, and McDaniel LS. Novel Importer Proteins AliC and AliD Enhance Virulence of Nonencapsulated *Streptococcus pneumoniae*. 2016 ASM Microbe Meeting, Boston, MA, USA.
15. Pipkins HR, Keller LE, **Bradshaw JL**, and McDaniel LS. Expression of the Nonencapsulated Virulence Protein PspK in Encapsulated *Streptococcus pneumoniae*. 2016 ASM Microbe Meeting, Boston, MA, USA.
16. **Bradshaw JL**, Pipkins HR, and McDaniel LS. Novel Proteins Mediate Virulence of Nonencapsulated *Streptococcus pneumoniae*. 2016 Pneumococcal Symposium, Mississippi State University, Starkville, MS, USA.
17. **Bradshaw JL**, Pipkins HR, Keller LE, Friley JM, and McDaniel LS. AliC and AliD Enhance Virulence of Nonencapsulated *Streptococcus pneumoniae*. 2015 UMMC Graduate Research Day, Jackson, MS, USA.
18. Pipkins HR, **Bradshaw JL**, Blocker AM, McDaniel LS. Identifying Novel Virulence Genes in Nonencapsulated *Streptococcus pneumoniae*. 2015 UMMC Research Day, Jackson, MS, USA.
19. **Bradshaw JL***, Pipkins HR, Keller LE, Friley JM, McDaniel LS. AliC and AliD Enhance Virulence of Nonencapsulated *Streptococcus pneumoniae*. 2015 ASM South Central Branch Meeting, Hattiesburg, MS, USA.
20. Pipkins HR, Keller LE, **Bradshaw JL**, Friley JM, Swiatlo E, and McDaniel LS. Deletion of Polyamine Transporter *potABCD* Attenuates the Virulence of Encapsulated but Not Nonencapsulated *Streptococcus pneumoniae*. 2015 ASM South Central Branch Meeting, Hattiesburg, MS, USA.
21. **Bradshaw JL***, Keller LE, Pipkins HR, Friley JM, and McDaniel LS. Presumed Importer Proteins AliC and AliD Enhance Virulence of Nonencapsulated *Streptococcus pneumoniae*. 2015 ASM General Meeting, New Orleans, LA, USA.
22. Pipkins HR, Keller LE, **Bradshaw JL**, Friley JM, Swiatlo E, and McDaniel LS. Deletion of Polyamine Transporter *potABCD* Attenuates the Virulence of Encapsulated but Not Nonencapsulated *Streptococcus pneumoniae*. 2015 ASM General Meeting, New Orleans, LA, USA.
23. **Bradshaw JL**, Keller LE, Pipkins HR, Friley JM, and McDaniel LS. AliC and AliD of Nonencapsulated *Streptococcus pneumoniae* Enhance Nasopharyngeal Colonization in a Mouse Model and Otitis Media (OM) in a Chinchilla Model. 2014 UMMC Graduate Research Day, Jackson, MS, USA.
24. Pipkins HR, Keller LE, **Bradshaw JL**, Friley JM, and McDaniel LS. PotD, a Pneumococcal Polyamine Transporter, Is Required for Full Virulence of Nonencapsulated *Streptococcus pneumoniae* in Otitis Media. 2014 UMMC Graduate Research Day, Jackson, MS, USA.

SEMINAR PRESENTATIONS

1. Mechanisms Enhancing Persistence and Virulence of *Streptococcus pneumoniae*: Impact on Mucosal Infections and Invasive Potential, UMMC, Jackson, MS, USA. March 20, 2018.
2. Mucosal Infections and Invasive Potential of Nonencapsulated *Streptococcus pneumoniae* Are Enhanced by Oligopeptide Binding Proteins AliC and AliD, St. Jude, Memphis, TN, USA. February 5, 2018.
3. Mucosal Infections and Invasive Potential of Nonencapsulated *Streptococcus pneumoniae* Are Enhanced by Oligopeptide Binding Proteins AliC and AliD, Tulane University, New Orleans, LA, USA. January 30, 2018.
4. Mucosal Infections and Invasive Potential of Nonencapsulated *Streptococcus pneumoniae* Are Enhanced by Oligopeptide Binding Proteins AliC and AliD, University of Tennessee Health Sciences Center, Memphis, TN, USA. December 11, 2017.
5. Oligopeptide Binding Proteins AliC and AliD of Nonencapsulated *Streptococcus pneumoniae* (NESp): Impact on NESp Physiology and Virulence, UMMC, Jackson, MS, USA. April 26, 2017.
6. Interferon with Antibody Responses During Persistent Viral Infections, UMMC, Jackson, MS, USA. December 15, 2016.
7. Interleukin-22 Restricts Bacterial Dissemination During Acute Pneumonia, UMMC, Jackson, MS, USA. December 12, 2016.
8. Dual RNA-seq as a Monitor of Host-Pathogen Interactions During an Intracellular Infection, UMMC, Jackson, MS, USA. March 28, 2016.
9. IL-23p19 Endogenously Activates Endothelial Inflammation, UMMC, Jackson, MS, USA. Mar 5, 2016.
10. Modulation of Antiviral Response During Coinfection with Influenza Virus and *Streptococcus pneumoniae*, UMMC, Jackson, MS, USA. March 23, 2015.
11. Toxin-Antitoxin Systems, UMMC, Jackson, MS, USA. March 18, 2015.
12. AliC and AliD Enhance Virulence of Nonencapsulated *Streptococcus pneumoniae*, UMMC, Jackson, MS, USA. December 1, 2014.
13. IL-35 Producing B-cells as Regulators of Immune Suppression, UMMC, Jackson, MS, USA. April 29, 2014.
14. Ebola: Every Day Counts, UMMC, Jackson, MS, USA. April 7, 2014.

RESEARCH SKILLS

Laboratory Skills: Tissue cell culture (human A549 pulmonary, Detroit 562 pharyngeal, and Bewo trophoblast epithelial cell lines, as well as an immortalized human glomerular endothelial cell line), immunological assays (western blot, ELISA, flow cytometry), lymphocyte and polymorphonuclear granulocyte isolation from whole blood, murine infection models (nasopharyngeal colonization, ascension to middle ear, pulmonary infections, sepsis/retro-orbital bleeding), murine colony husbandry, chinchilla model of middle ear infection and saphenous vein blood collection, rat surgeries (catheritization of carotid artery and jugular vein, as well as performing the reduced uterine perfusion pressure "RUPP" surgery to mimic placental conditions of preeclampsia), blood pressure measurements using transducers and lab chart software, luciferase in vivo imaging (IVIS), PCR including sequence overlap extension (SOE) and RT-PCR, DNA manipulation/mutagenesis, plasmid cloning and recombinant engineering, isolation and purification of DNA, RNA, and protein (chromatography, dialysis, vacuum centrifugation, and concentration), antibiotic susceptibility testing, bacterial culture and transformation (BSL-2), bacterial cell wall isolation, bacterial survival analysis, biofilm quantification, hemolysis quantification, whole genome Illumina sequencing with MiSeq platform.

Computational Skills: Genomic sequence analysis: read-mapping, variant calling, annotation, assembly, RNA-seq expression analysis; Functional/Network Analysis: KEGG, DAVID, WebGestalt, PyMol; Phylogenetics: BLAST, MEGA, MUSCLE; Code: Unix (Bio-Linux), R Studio; GraphPad PRISM; Microsoft Office.

Workshops Attended: Modeling Immunology, June 2017, Emory University, Atlanta, GA, USA.

TEACHING EXPERIENCE

2017-2018	Fundamental Microbiology Tutor.
2016	Guest Lecture: "Bacterial and Viral Genetic Systems". Mississippi College, Clinton, MS, USA. Biology after Dark (BAD) lecture, Lecture Series Instructor: Dr. Erin Norcross.
2016	Guest Lecture: "Intestinal Parasites: Roundworms and Tapeworms". William Carey University, Hattiesburg, MS, USA. General Microbiology, Course Instructor: Dr. Stacey Fairley.
2016	Guest Lecture: "The Development of T-Lymphocytes". Mississippi College, Clinton, MS, USA. BIO415/5415 Immunology, Course Instructor: Dr. Erin Norcross.
2016-Present	Moderator of medical student (M2) small group anaphylaxis simulation.
2014-2018	Medical Biochemistry and Medical Microbiology Tutor.
2014	Medical Microbiology laboratory teaching assistant.

MENTORING EXPERIENCE

2018-Present	Weiwei Yang (China), Visiting research scientist, Assistant Professor rank.
2018-Present	Luke Strong (University of Mississippi), Summer Undergraduate Research Experience (SURE) student.
2017	Jonathan Crider (UMMC), Microbiology and Immunology rotating graduate student.
2017	Brent Breland (UMMC), Microbiology and Immunology rotating graduate student.
2016-2018	Caleb Martin (UMMC), Medical Scholars Research Program (MSRP) student.
2016	Rachel Pearson (Columbus State University), Summer Undergraduate Research Experience (SURE) student.
2016	Hillary Leonard (G.V. Sonny Montgomery VA Medical Center), Research Internship.
2016	Sarah Thurmon (UMMC), Microbiology and Immunology rotating graduate student.
2015	Lauren Bicker (Mississippi College), Summer Undergraduate Research Experience (SURE) student.
2015	Aaron Blocker (Mississippi College), Mississippi INBRE undergraduate student.
2015	J.R. Kent (UMMC), Microbiology and Immunology rotating graduate student.
2014	Hannah Rice (UMMC), MD/PhD rotating student.
2014	Claresa Youngblood (Tougaloo College), Summer Undergraduate Research Experience (SURE) student.
2013-2016	Cheshil Dixit (UMMC), Medical Scholars Research Program (MSRP) student.

PROFESSIONAL SOCIETIES

2018-Present	American Physiological Society
2018-Present	American Heart Association
2016-Present	Mississippi Academy of Sciences
2016-Present	University of Mississippi Medical Center Group on Women in Medicine and Science
2015-Present	American Society for Microbiology South Central Branch
2012-2013	Oklahoma State University Microbiology Club
2011-Present	American Society for Microbiology

SERVICE

2018	Poster judge, School of Health-Related Professions Research Day, UMMC
2018	Poster judge, Mississippi Academy of Sciences (MAS) General Meeting, High School Division
2017	Author, UMMC Associated Student Body Resolution 16-2: A resolution reaffirming our commitment to an inclusive and diverse learning environment at UMMC
2017	Author, UMMC Associated Student Body Resolution 16-1: A resolution supporting current Mississippi immunization policy and requirement of vaccination for school attendance
2017	Poster judge, Mississippi Academy of Sciences (MAS) General Meeting, High School Division

2016-2018 Microbiology and Immunology Team Leader, Discovery U Outreach Event
2016-2017 Secretary/Treasurer, UMMC Graduate Student Body
2016-2017 Associated Student Body Representative, UMMC
2015 Graduate representative at UMMC high school recruitment event
2015-2017 Science fair judge: Madison Ridgeland Academy, Davis Magnet Elementary, and St. Richard Catholic School
2014-2015 Philanthropy Coordinator, UMMC Graduate Student Body
2014-2015 Associated Student Body Representative, UMMC
2014-2015 Microbiology and Immunology booth volunteer, Discovery U Outreach Event
2014-2018 Microbiology and Immunology departmental representative at graduate school recruitment events
2014-2016 Graduate student body booth team leader, Spooky U Philanthropy Outreach Event
2013 Graduate student body booth volunteer, Spooky U Philanthropy Outreach Event
2013-2014 Community Outreach Committee Member, UMMC graduate student body
2013 Poverty simulation volunteer, UMMC Diversity and Inclusion event

RESEARCH FUNDING

2018-Present NIH Ruth L. Kirschstein National Research Service Award T32HL105324-08
University of Mississippi Medical Center
PI: Joey P. Granger, Ph.D.