

BIOGRAPHICAL SKETCH

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NAME Zhang, Shuping	POSITION TITLE Associate Professor		
eRA COMMONS USER NAME shupingzhang	College of Veterinary Medicine Texas A&M University		
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Shanxi Agricultural University, China	B.V.M.	1985	Veterinary Medicine
Northwestern Agricultural University, China	M.S.	1988	Veterinary Histology
Kansas State University, Manhattan, KS	Ph.D.	1999	Microbiology
Texas A&M University, College Station, TX	Postdoc	2002	Microbiology
American College of Veterinary Microbiologists	Diplomat	2009	Bacteriology/Mycology

A. Personal Statement.

Research: Infectious diseases exact a heavy toll on human and animal health. According to the Centers for Disease Control and Prevention (CDC) reports, 160,000 Americans die each year with an infectious disease as the underlying cause of death. *Salmonella enterica* induced enterocolitis is the second most frequent cause of bacterial food-borne illness in the United States, with an estimated 1.4 million cases per year. Although *Salmonella enterica* can cause life-threatening infections in people, the organisms usually do not induce overt clinical signs in certain host species, such as adult birds, cats, and dogs. In addition to *Salmonella* organisms, many other bacterial and viral pathogens can cause life-threatening diseases in animals. As a microbiologist, my research focuses on the pathogenesis, diagnosis, and treatment of infectious diseases, with a special emphasis on avian infectious diseases and zoonosis. Listed below are on-going research projects in my laboratory.

1. Understanding the molecular interactions between *Salmonella* virulence genes and host cationic antimicrobial peptides, avian beta-defensins (AvBDs).
2. Surveillance of *Salmonella enterica* in companion animals, including dogs, cats, and horses.
3. Surveillance of *Salmonella* and other microbial pathogens in Bobwhite Quail populations.
4. A comparative study of diagnostic tests for proventricular dilatation disease in Psittacine birds.

Diagnostics: As a clinical microbiologist, I oversee the Clinical Microbiology Laboratory of Texas A&M University Veterinary Teaching Hospital. I provide consultation to faculty and residents on infectious diseases and selection of antimicrobials for therapeutic use in animals. The Clinical Microbiology Laboratory processes animal and environmental specimens, performs bacterial and fungal cultures, and determines antimicrobial susceptibility patterns of pathogenic bacteria from nearly all animal species.

B. Positions and Honors

Positions and Employment (in chronologic order)

08/1988 – 11/1992	Assistant Research Scientist, Beijing Institute of Animal Science & Veterinary Medicine
12/1992 – 06/1995	Research Associate, Immunology & Disease Resistance Laboratory, USDA, ARS, Beltsville, MD
01/2000 – 10/2002	Postdoctoral Research Associate, Department of Pathobiology, College of Veterinary Medicine, Texas A & M University
10/2002 – 06/2007	Assistant Clinical Professor, Department of Pathobiology & Population Medicine, College of Veterinary Medicine, Mississippi State University
07/2007 – 08/2010	Associate Clinical Professor, Department of Pathobiology/Population Medicine, College of Veterinary Medicine, Mississippi State University

10/2002 – 07/2010	Head, Bacteriology/Mycology/Serology Sections, Mississippi Veterinary Research & Diagnostic Laboratory, Mississippi State University
08/2010 – 12/2011	Clinical Associate Professor, Director of Clinical Microbiology, Department of Veterinary Pathobiology, College of Veterinary Medicine, Texas A&M University
01/2011 – Present	Associate Professor, Director of Clinical Microbiology, Department of Veterinary Pathobiology, College of Veterinary Medicine, Texas A&M University

Honors

- 1995 Outstanding Contribution to Studies on Host Immunity to Avian Coccidiosis, USDA/ARS/PIL.
- 2005 Dean's Pegasus Award for Significant Contributions and Excellence in Clinical/Diagnostic/Extension Service, College of Veterinary Medicine, Mississippi State University.
- 2008 Featured MSU Faculty – "Zhangs Make Work a Top Priority for Lab to Meet the State's Veterinary Needs". Starkville Daily News, Sunday, June 29, 2008.
- 2008 Highlight – "MSU Serves through the Mississippi Veterinary Research and Diagnostic Lab". System Review, Mississippi Board of Trustees of State Institute of Higher learning. 3(24), August 8, 2008.
- 2012 Clinical Service Award, Veterinary Medical Teaching Hospital, College of Veterinary Medicine & Biomedical Sciences, Texas A&M University.
- 2010 – Editorial Board, Journal of Veterinary Diagnostic Investigation

Other Experience and Professional Memberships

- 2003 – Present American Association of Veterinary Laboratory Diagnosticians
- 2006 – Present Conference of Research Workers in Animal Diseases
- 2006 – Present American Association of Avian Pathologists.
- 2008 – Present US Animal Health Association
- 2009 – Present American Veterinary Medical Association

C. Selected Peer Reviewed Publications (in chronological order)

1. **S. Zhang*** and G. C. Stewart. Characterization of the promoter elements for staphylococcal enterotoxin D gene. *Journal of Bacteriology* 182: 2321-2325, 2000.
2. R. L. Santos, R. M. Tsolis, **S. Zhang†**, T. A. Ficht, A. J. Baumler, L. G. Adams. *Salmonella*-induced cell death is not required for enteritis in calves. *Infect Immun* 69: 4610-4617, 2000.
3. **S. Zhang†** and G. C. Stewart. Staphylococcal enterotoxins. In: Honeyman, A. L., H. Friedman, and M. Bendineli (eds), *Staphylococcus aureus* Infection and Disease. Kluwer Academic/Plenum Publishers, New York. 2001.
4. R. L. Santos, **S. Zhang†**, R. M. Tsolis, R. A. Kingsley, L. G. Adams, and A. J. Baumler. Animal model of *Salmonella* infections: enteritis versus typhoid fever. *Microbes and Infection*. 3: 1335-1344, 2001.
5. R. L. Santos, **S. Zhang†**, R. M. Tsolis, A. J. Baumler, and L. G. Adams. Morphologic and molecular characterization of *Salmonella typhimurium* infection in neonatal calves. *Vet Pathol*. 39: 200-215, 2002.
6. **S. Zhang†**, R. L. Santos, R. M. Tsolis, A. J. Baumler, and L. G. Adams *Salmonella enterica* serotype Typhimurium Effector Proteins SipA, SopA, SopB, SopD and SopE2 act in concert to induce diarrhea in calves. *Infect Immun*. 70: 3843-3855, 2002.
7. **S. Zhang†**, R. L. Santos, R. M. Tsolis, S. Mirolid, W. Hardt, L. G. Adams, and A. J. Baumler. Phage mediated horizontal transfer of the sopE1 gene increases enteropathogenicity of *Salmonella enterica* serotype Typhimurium for calves. *FEMS Microbiol Lett*. 217: 243-247, 2002.
8. **S. Zhang†**, R. A. Kingsley, R. L. Santos, H. Andrews-Polymenis, M. Raffatellu, J. Figueiredo, J. Nunes, R. M. Tsolis, L. G. Adams and A. J. Baumler. Molecular Pathogenesis of *Salmonella enterica* serotype Typhimurium-induced diarrhea. *Infect Immun*. 71:1-12, 2003.
9. A. D. Humphries, M. Raffatellu, S. Winter, E. H. Weening, R. A. Kingsley, R. Droleskey, **S. Zhang†**, J. Figueiredo, S. Khare, J. Nunes, L. G. Adams, R. M. Tsolis, A. J. Baumler. The use of flow cytometry to detect expression of subunits encoded by 11 *Salmonella enterica* serotype Typhimurium fimbrial operons. *Mol Microbiol*. 48:1357-1376, 2003.

10. **S. Zhang**‡, L. G. Adams, J. Nunes, S. Khare, R. Tsolis, A. Bäumler. Secreted effector proteins of *Salmonella enterica* serotype typhimurium elicit host-specific chemokine profiles in animal models of typhoid fever and enterocolitis. *Infect Immun*.71: 4795-4803, 2003.
11. B. P. Reis, **S. Zhang**‡, R. M. Tsolis, A. J. Baumler, L. G. Adams, R. L. Santos. The attenuated sopB mutant of *Salmonella enterica* serovar Typhimurium has the same tissue distribution and host chemokine response as the wild type in bovine Peyer's patches. *Vet Microbiol*. 97: 269-77, 2003.
12. C. W. Tseng, **S. Zhang** and G. C. Stewart. Accessory Gene Regulator (Agr) Control of Staphylococcal Enterotoxin D Gene Expression. *J. Bacteriol*. 186:1793-801, 2004.
13. S. Khare, T. A. Ficht, R. L. Santos, J. Romano, A. R. Ficht, **S. Zhang**‡, I. R. Grant, M. L. Libal, D. Hunter, and L. G. Adams. Rapid and sensitive detection of *Mycobacterium avium* subsp. *paratuberculosis* in bovine and American bison milk and fecal samples by an immunomagnetic bead-real time PCR. *J. Clin. Microbiol*. 42:1075-1081, 2004.
14. **S. Zhang****, F. Wilson, and L. Pace. *Streptococcus pneumoniae* associated Cellulitis and Pneumonia in a Two-Month-Old Domestic Shorthair Kitten. *J Vet Diagn Invest* 18:221-224, 2006.
15. Z. Zhang, F. Wilson, R. Read, L. Pace, and **S. Zhang****. Detection and Characterization of naturally occurring West Nile Virus Infection in a Wild Female Turkey. *J Vet Diagn Invest* 18:204-208, 2006.
16. H. S. Lillehoj, C. H. Kim, C. L. Keeler Jr., **S. Zhang****. Immunogenomic approaches to study host immunity to enteric pathogens. *Poultry Science* 86:1491-1500, 2007.
17. **S. Zhang****, Z. Zhang, S. Liu, W. Bingham, F. Wilson. Fatal yersiniosis in farmed deer caused by *Yersinia pseudotuberculosis* serotype O:3 encoding a mannosyltransferase-like protein WbyK. *J Vet Diagn Invest*. 20:356-359, 2008.
18. **S. Zhang****, H. S. Lillehoj, C. H. Kim, C. L. Keeler, U. Babu, M. Z. Zhang, Transcriptional response of chicken macrophages to *Salmonella enterica* serovar Enteritidis infection. *Dev Biol (Basel)*. 132:141-51, 2008.
19. S. Li*, Z. Zhang, L. Pace, H. S. Lillehoj, **S. Zhang****. Functions exerted by the virulence-associated type-three secretion systems during *Salmonella enterica* serovar Enteritidis invasion into and survival within chicken oviduct epithelial cells and macrophages. *Avian Pathol*. 38:97-106, 2009.
20. K. L. Ebers[^], C. Y. Zhang[†], M. Z. Zhang, R. H. Bailey, and **S. Zhang****. Transcriptional profiling avian beta-defensins in chicken oviduct epithelial cells before and after infection with *Salmonella enterica* serovar Enteritidis. *BMC Microbiol*. 9:153, 2009.
21. S. Li*, M. Z. Zhang, L. Yan*, H. S. Lillehoj, L. W. Pace, and **S. Zhang****. Induction of CXC chemokine mRNA expression in chicken oviduct epithelial cells by *Salmonella enterica* serovar Enteritidis via the type three secretion system-1. *Avian Diseases*. 53(3):396-404, 2009.
22. S. Khare, W. Alali, **S. Zhang** , D. Hunter, R. Pugh, F. C. Fang, S. J. Libby, and L. Garry Adams. Vaccination with attenuated *Salmonella enterica* Dublin expressing E coli O157:H7 outer membrane protein Intimin induces transient reduction of fecal shedding of E coli O157:H7 in cattle. *BMC Veterinary Research* 6:35, 2010.
23. An efficient DNA extraction method for polymerase chain reaction-based detection of *Mycobacterium avium* subspecies *paratuberculosis* in bovine fecal samples. M. Z. Zhang and **S. Zhang****. *J Vet Diagn Invest*. 23:41-48, 2011.
24. L. Yan*, **S. Zhang**, H. Wan, L. W. Pace, F. Wilson, M. Z. Zhang. Combination of reverse transcription real-time polymerase chain reaction and antigen capture enzyme-linked immunosorbent assay for the detection of animals persistently infected with Bovine viral diarrhea virus. *J Vet Diagn Invest*. 23:16-25, 2011.
25. Laboratory diagnosis of deerpox virus infection in a white-tailed deer fawn. B. Baughman, **S. Zhang**, L. Jin, L. W. Pace, J. Cooley, L. Yan*, M. Z. Zhang. *J Vet Diagn Invest*. 23:965-970, 2011.
26. J. Tomlinson, J. Cooley, **S. Zhang**, M. Johnson. Granulomatous lymphadenitis in a labrador retriever due to *talaromyces helicus*. *Vet Clin Path*. 40(4): 553-557, 2011.
27. **S. Zhang****, W. Corapi, E. Quist, S. Griffin, M. Zhang. Disseminated Aspergillosis in a German Shepherd Dog Caused by *Aspergillus versicolor*. *J. Clin. Microbiol*. 50:187-191, 2011.

28. M. Zhang, L. Yan, G. Zhu, M. Holifield, D. Todd, and **S. Zhang****. Isolation and characterization of *Streptococcus troglodytidis* sp. nov., from a foot abscess of a chimpanzee (*Pan troglodytes*). Int J Syst Evol Microbiol. 2012 Mar 30. [Epub ahead of print]
29. Mural endocarditis caused by *Corynebacterium mustelae* in a dog with a ventricular septal defect. R. L. Winter†, S. G. Gordon, **S. Zhang**, C. D. Hariu, M.W. Miller. JAAHA. In press. 2013.

D. Selected Abstracts & Presentations

1. **S. Zhang**, H. S. Lillehoj, C.-H. Kim, C. L. Keeler, Jr., M. Zhang. Transcriptional response of chicken macrophages to *Salmonella enterica* serovar Enteritidis infection. AGAH 2007.
2. **S. Zhang**, S. Li, M. Zhang. Functions exerted by the type three secretion systems (TTSS) during *Salmonella enteritidis* infection of chicken reproductive epithelial cells and macrophages. AVMA/AAAP 2007.
3. **S. Zhang**, M. Zhang, S. Liu, F. Wilson, and W. Bingham. Yersiniosis in farmed cervids caused by a distinct O-genotype of *Yersinia pseudotuberculosis*. AAVLD 2007.
4. **S. Zhang**, F. Wilson, Sue Ann Hubbard, G. Senties, and D. Magee. Outbreak of meningitis (Meningoencephalitis) in commercial broiler chickens. AAVLD. 2008.
5. F. Wilson, **S. Zhang**, S. A. Hubbard and D. Magee. Unusual pathology manifested with an outbreak of *Ornithobacterium rhinotracheale* associated meningoencephalitis in commercial broiler chickens. AAAP. 2009.
6. **S. Zhang** and M. D. Lundrigan. Characterization of serine/threonine protein kinases of *Mycobacterium avium* subsp. Paratuberculosis. ASM 2009.
7. L. Yan, S. Zhang, L. W. Pace, F. Wilson, M. Z. Zhang. Application of a real-time reverse transcriptase polymerase chain reaction and an antigen capture enzyme-linked Immunosorbent assay to detect animals infected with bovine viral diarrhea virus. (**Best Poster Award**). AAVLD. 2009.
8. R. W. Wills, R. H. Bailey, **S. Zhang**, V. V. Volkova, S. A. Hubbard, D. L. Magee, J. A. Byrd. Distribution of *Salmonella* serotypes in broilers from day of hatch through immersion chill tank. 5th Annual Applied Animal and Public Health Research and Extension Symposium, AAEV, AAVLD/USAHA. 2009.
9. L. Zhao, M. Zhang, and **S. Zhang**. Expression, purification and antimicrobial activity of avian beta-defensin-2, -6, and -12. CRWAD. 2009.
10. L. Yan, **S. Zhang**, L. W. Pace¹, H. Wan, M. Zhang. Application of RRT-PCR and ACE on ear notch and serum samples to monitor bovine viral diarrhea virus (BVDV)-status in Mississippi herds. CRWAD. 2009.
11. R. H. Bailey, R. W. Wills, S. D. To, **S. Zhang**, J. A. Byrd system dynamics of *Salmonella* and *Campylobacter* contamination in the chill tank during broiler processing. International Association for Food Protection Annual Dallas, TX. 2009.
12. L. H. King, R. W. Wills, K. Dazo-Galarneau, **S. Zhang**, J. A. Byrd, R. H. Bailey Evaluation of sampling and culture methods for *Salmonella* enumeration by most probable number in broiler carcass rinses. Merck Merial Veterinary Student Symposium 2009.
13. L. Yan, B. Baughman, L. Pace, **S. Zhang**, M. Zhang. Antigenic variations associated with poor performance of direct fluorescent antibody test to detect bovine viral diarrhea virus (BVDV) II antigen in fresh tissues. CRWAD 2010.
14. M. Zhang and **S. Zhang**. Improved DNA extraction for PCR detection of *Mycobacterium avium* subspecies Paratuberculosis in bovine fecal specimen. AAVLD, 2010.
15. M. Zhang, B Baughman, L. Yan, L. Pace, **S. Zhang**. Failed detection of bovine viral diarrhea virus type II infection by direct FA. AAVLD, 2010.

16. M. Zhang, L. Yan, and S. **Zhang**. *Streptococcus anginosus*, what do we know? AAVLD, 2010.
17. S. **Zhang**, W. Corapi, E. Quist, S. Griffin, M. Zhang. Disseminated Aspergillus versicolor infection in a dog. AAVLD. 2011
18. S. **Zhang**. Feline necrotizing myofasciitis involving *Arcanobacterium canis* --What has been learned?
19. Salmonelle enterica serovar Enteritidis Genes Overexpressed in Chicken Cells. S. Zhang. Diseases In nature (DIN). June, 2012. San Antonio, TX.
20. Graphical pharmacokinetic data in companion animals to assist with interpretation of antimicrobial susceptibility testing results. V. Fajt, S. Lawhon, S. Zhang. Pharmacology teaching Workshop. June 2012. College Station, TX.
21. Salmonella prevalence in pets – CVM’s collaboration with 11 veterinary diagnostic laboratories. 2nd Annual FDA Foods Program Science and Research Conference. August, 2012.
22. Veterinary laboratory diagnostic operations and standards in the US. S. Zhang (Invited talk). Veterinary Medical Research Center of Da Bei Nong Animal health, China. August, 2012.
23. Prevalence of potentially pathogenic bacterial and fungal agents in Bobwhite quail in Rolling Plains Ecoregion. AAVLD. October, 2012. Greensboro, NC.
24. Salmonellosis in animals. S. Zhang (Invited talk). AAVLD. October, 2012. Greensboro, NC.
25. Salmonella Pathogen-Host Interactions: A Never-Ending Story. S. Zhang, November, 2012. JAAS, China.

E. Research Support

Active Research Support

1. Rolling Plains Quail Research Foundation. S. Zhang (PI) 07//2011 – 06/2013
Bacterial and Fungal Pathogens Involved in Idiopathic Decline of Bobwhite Quail.
2. Food and Drug Administration FDA-U18 FD004313-01.
Prevalence of Salmonella in symptomatic and asymptomatic companion animals.
S. Lawhon & S. Zhang (CO-PIs) 09/2011 – 08/2013
3. Food and Drug Administration FDA-U18 FD004638-01
FDA Vet-LRN Site Application
S. Lawhon & S. Zhang (CO-PIs) 06//2012 – 05/2017.
4. Morris Animal Foundation
A Comparative Study of Diagnostic Tests for Proventricular Dilatation Disease in Psittacine Birds.
S. Zhang (PI), D. Brightsmith, I. Tizard. 09/2012 – 08/2014.

Selected Completed Research Support in Past Five Years

- Laboratory Testing of Dead Bird Tissues for the Presence of West Nile Virus.
USDA CSREES. H. Bailey (PI), S. Zhang (Co-PI). 2006 – 2009
System Dynamics of Salmonella and Campylobacter Contamination in Chill Tank during
Broiler Processing.
Board of Animal Health. L. Pace (PI), S. Zhang (Co-PI). 2009 – 2010
NPIP Lowpath AI Surveillance.