

I. PERSONAL HISTORY AND PROFESSIONAL EXPERIENCE

A. Educational Background

1978	The Pennsylvania State University	B.S.	Animal Science
1978	The Pennsylvania State University	B.S.	Agricultural Education
1980	The Pennsylvania State University	M.S.	Veterinary Science
1989	The Pennsylvania State University	Ph.D.	Microbiology

B. Academic Positions Since Final Degree

Jan. 1989 - July 1993	Assistant Professor of Veterinary Microbiology, Veterinary Medical Diagnostic Laboratory, College of Veterinary Medicine, University of Missouri, Columbia, MO 65211.
July 1993 - June 2000	Assistant Professor of Veterinary Science, Head of Bacteriology Services, Pennsylvania Avenue Diagnostic Laboratory System, The Pennsylvania State University, University Park, PA 16802.
July 2000 - July 2003	Clinical Associate Professor and Head Microbiology Section, Veterinary Diagnostic Laboratory, College of Veterinary Medicine, University of Illinois, Urbana, IL 61802.
July 2003 – July 2007	Clinical Associate Professor of Pathobiology, Department of Veterinary Pathobiology, and Head Microbiology Section and Co-Head Molecular Diagnostic Services (49% effort), Veterinary Diagnostic Laboratory, College of Veterinary Medicine, University of Illinois, Urbana, IL 61802.
July 2003 – July 2007	Associate Professor of Pathobiology (Q appointment*) (51% effort), Department of Pathobiology, College of Veterinary Medicine, University of Illinois, Urbana, IL 61802.
July 2007 - Present	Associate Professor of Pathobiology with Tenure , Department of Pathobiology, and Head Microbiology Section and Co-Head Molecular Diagnostic Services, Veterinary Diagnostic Laboratory, College of Veterinary Medicine, University of Illinois, Urbana, IL 61802.
Aug. 2013 – Present	Professor of Pathobiology with Tenure . Department of Pathobiology, and Head Microbiology Section and Co-Head Molecular Diagnostic Services, Veterinary Diagnostic Laboratory, College of Veterinary Medicine, University of Illinois, Urbana, IL 61802.

*Q appointment - From July 2000 through August 2003, Dr. Maddox's appointment was 80% diagnostic service and 20% teaching and research. The change to Associate Professor with a 51% research and teaching appointment in the Department of Veterinary Pathobiology and 49% diagnostic service appointment in August of 2003 began the shortened 4-year tenure track stipulated by the "Q" appointment.

C. Other Professional Employment: None.

D. Honors, Recognitions and Outstanding Achievements

1973	Valedictorian, W.B. Saul High School of Agricultural Sciences, Bulletin Award, Philadelphia Board of Education Scholarship.
1973	Bausch and Lomb Award, American Society for Microbiology.
1975, 1977, 1978	Dean's List, The Pennsylvania State University.
2004 SP, 2012 F & 2014 F	Incomplete List of Teachers Ranked Excellent by Their Students, University of Illinois, Urbana, IL.
Sept. 2007	The Dr. Gordon and Mrs. Helen Kruger Service Excellence Award, College of Veterinary Medicine, University of Illinois, Urbana, IL.

May 2008 The Arnold O. Beckman Research Award for special distinction, special promise or special resources value, University of Illinois, Urbana, IL.

E. Invited Lectures and Invited Conferences Presentations

Dr. Maddox had 11 invited lectures prior to her appointment at UIUC.

12. Antibiotic use and cephalosporin resistance in *Salmonella sp.* from cattle. Pharmacia Animal Health Expert Panel, Kalamazoo, MI, 2001.
13. Use of bulk tank cultures and Johne's disease detection. Illinois Dairy Field Representative and Sanitarians, University of Illinois Extension, Champaign, IL, 2001.
14. Recombination in vivo and other mechanisms of genetic drift in group C Streptococci. Fort Dodge Animal Health Biologics Research and Development Division, Fort Dodge, IA, 2004.
15. Mechanisms of *Pasteurella multocida* survival and virulence: Potential effects on transmission of avian cholera in flamingos. Transdisciplinary Symposium on Recent Mass Die-offs of Lesser Flamingos (*Phoeniconaias minor*) in Eastern and Southern Africa. Supported by the Olga G. Nalbandov Lecture Fund and the William and Flora Hewlett International Conference Grants, College of Veterinary Medicine, University of Illinois, 2004.

Invited presentations since promotion to associate professor with tenure at UIUC.

16. Optimizing antimicrobial therapy through use of minimal inhibitory concentration testing. Continuing Education Symposium for Illinois Veterinarians, Veterinary Diagnostic Laboratory, 2008.
17. University of Illinois – Urbana Champaign stance on biosafety. The Big Ten Internal Audit Conference, Urban, IL, June 8, 2009.
18. Salmonella zoonosis and methods for reducing risks of salmonellosis. Life Long Learning Institute Series, Osher Center, UIUC, February 2011.
19. Transfer of methicillin resistance and virulence factors between staphylococci. Mini-symposium on methicillin resistant staphylococci. 54th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians, Buffalo, NY, September 30, 2011, pg. 65-80.

Invited presentations since promotion to professor with tenure at UIUC.

20. Maddox, C.W. Meeting Increasing Demands Upon Veterinary Diagnostic Microbiology Services
Invited Speaker - A.L. Bortree Lecture Penn State University, Wed. Sept 11, 2013 University Park, PA.

F. Offices Held in Professional Societies: None

G. Editorships of Journals or Other Learned Publications: None.

H. Grants Received

Dr. Maddox had received 29 grants prior to her appointment at UIUC.

30. H. Gelberg (PI), J. Andrews and **C.W. Maddox** (CoPI). Infrastructure in support of food safety research. Illinois Council on Food and Agricultural Research, Project #00Si-024-4A. 1999-2001, \$53,750.
31. **C.W. Maddox** (PI). Provide clinical isolates and MIC data for an antimicrobial susceptibility monitoring program. Pharmacia/Pfizer Animal Health Contract. 2001-present ~\$6,000/yr. for ~ 200 isolates.
32. **C.W. Maddox** (PI). RiboPrinting® *Bacillus anthracis* isolates for national database. Qualicon Division of DuPont. 2001, \$3,120.
33. **C.W. Maddox** and K. Harlin (CoPIs). Pilot study to determine the feasibility of detecting *Bacillus anthracis* in rain water. National Atmospheric Deposition Program. 2002-2003, \$6,732.

34. G. Scherba, **C.W. Maddox** and J. Andrews (CoPIs). Molecular pathogen detection for herd health and food safety. Illinois Council on Food and Agricultural Research, Project #02I-057-3. 2001-2004, \$120,000.
35. **C.W. Maddox** (PI), I. Kakoma and R. Singer (CoPI). Prevalence of cephalosporin resistance genes among swine isolates and relationship to host bacterial genotypes. Illinois Department of Agriculture Swine Disease Control. 2001-2003, \$21,726.
36. G. Scherba and **C.W. Maddox** (CoPIs). Rapid response for detection of veterinary pathogens. Venture Technology Funds (for equipment purchases). College of Veterinary Medicine, University of Illinois. 2002, \$57,995.
37. **C.W. Maddox** (PI). Optimizing molecular methods for discriminating between bacterial isolates capable of food borne illness. University of Illinois Campus Research Board. \$8,000 plus \$5,000 College of Veterinary Medicine Matching Funds. 2003-2004, \$13,000.
38. **C.W. Maddox** (PI) and R.M. Weigel (CoPI). Using integrons to monitor salmonella transmission in swine: Comparing genotypes. United States Department of Agriculture Hatch Funds. 2003-2004, \$19,205.
39. **C.W. Maddox** (PI), R.M. Weigel (CoPI). Monitoring salmonella in swine: Comparing antibiotic resistance integrons. United States Department of Agriculture Section 1433 Animal Health and Disease Research Funds. 2003-2004, \$19,205.
40. **C.W. Maddox** (CoI). Epidemiology and ecology of antimicrobial resistance determinants on dairy farms. United States Department of Agriculture, National Research Initiative Competitive Grants Program. Subcontract with University of Minnesota (R. Singer, PI). 2003-2004, \$229,470.
41. **C.W. Maddox** (PI) and M. Kim (CoPI). Detection of *Leptospira interrogans* serovars for clinical and environmental surveillance. University of Illinois Veterinary Medical Research Funds. 2003-2004, \$30,000 with \$30,000 match from industry. \$60,000.
42. **C.W. Maddox** (PI), W.M. Haschek, and R. Fredrickson (CoPI). Evaluation of the potential for recombination via genetic exchange between modified live *Streptococcus equi* subsp. *equi* vaccine and wild type strains. Fort Dodge Animal Health Technical Testing Agreement. 2003-2004, \$142,089.
43. **C.W. Maddox** (PI). Evaluation of the potential for recombination via genetic exchange between modified live *Streptococcus equi* subsp. *equi* vaccine and wild type strains. Fort Dodge Animal Health Technical Testing Agreement, Amendment #1. 2005-2006, \$201,761.
44. R.M. Weigel (PI) and **C.W. Maddox** (PI). Polymerase chain reaction techniques for detection and genotyping of salmonella: Evaluation of the accuracy, generalizability and validity of diagnostic testing results. Illinois Department of Agriculture Swine Disease Control. 2004-2006, \$37,715.
45. **C.W. Maddox** (PI) and R.M. Weigel (CoPI). Monitoring salmonella in swine: Comparing antibiotic resistance integrons. United States Department of Agriculture, Section 1433 Animal Health and Disease Research Funds. 2004-2005, \$18,844.
46. **C.W. Maddox** (PI). Genotypic difference in the lipopolysaccharide (LPS) *rfb* genes of *Leptospira interrogans* serovars. Spangler Companion Animal Fund Grant. 2005, \$5,993.
47. **C.W. Maddox** (CoPI) and C. Kuster (CoPI). *Enterococcus faecalis* cytolysin associated adverse effects upon swine fertility. Illinois Department of Agriculture Swine Disease Control. 2005-2006, \$14,450.
48. **C.W. Maddox** (PI). Characterization of deletion mutant strains of *Streptococcus equi* ssp. *equi*. Fort Dodge Animal Health Research Project. 2005-2006, \$98,383.
49. **C.W. Maddox** (PI). Pre-doctoral fellowship for Luke Borst. Fort Dodge Animal Health Funded. 2005-2006, \$32,000.
50. **C.W. Maddox** (PI), M. Pinkerton and L. Borst. A zebra fish model for Lancefield group C streptococcal pathogenesis. United States Department of Agriculture, Animal Health and Disease. 2005-2006, \$20,222.
51. **C.W. Maddox** (PI), L. Borst, and S. Patterson. Common virulence attributes of Lancefield group C streptococci. United State Department of Agriculture Hatch Program Funding. 2006-2007, \$19,974.

52. J.E. Pettigrew (PI), C.M. Parsons, J.R. Pluske, **C.W. Maddox**, M.S. Kuhlenschmidt. A novel method for disease control in livestock: DDGS and other fibrous feeds. Illinois Council on Food and Agricultural Research. 2006-2008, \$85,000.
53. K. Hart (PI), G.Y. Miller, **C.W. Maddox**, and G. Zinn. The effect of non-medicated feed on outdoor nursery pig health and performance. Illinois Department of Agriculture – Swine. 2006-2007, \$25,000.

Grants received since promotion to associate professor with tenure at UIUC.

54. **C.W. Maddox** (PI), L. Borst, S. Patterson. Determinant host factors of the zebrafish model of streptococcal pathogenesis. United States Department of Agriculture Hatch Program Funds. 2007-2008, \$23,790.
55. **C.W. Maddox** (PI), L. Borst, S. Patterson. Attenuation of *Streptococcus equi* ssp. *equi* virulence factors for a modified live vaccine. UIUC Campus Research Board Grant. 2008, \$12,316.
56. **C. W. Maddox** (co-PI), A. MacNeill, L. Borst, S. Patterson. Safety and efficacy of a triple deletion modified live vaccine against strangles. United States Department of Agriculture Hatch Program Funding. 2008-2009, \$25,000.
57. **C. W. Maddox** (PI). Probiotics in preventing wet tail in hamsters. Technical Testing Agreement with PetSmart. 2009, \$2,800.
58. **C.W. Maddox** (PI), S.K. Patterson. Investigations of CovS/CovR as a virulence factor of *Streptococcus equi*. United States Department of Agriculture Hatch Program Funding. 2009-2010, \$19,998.
59. C. Metry, **C. Maddox**, L. Dirkilou, K. Campbell. Determination of enrofloxacin stability in 4 base ear cleaner solutions for topical treatment of otitis externa. American College of Veterinary Dermatology. 2009-2010, \$ 6,920.
60. **C.W. Maddox** (Co-PI), H.F. Troutt. Evaluation of a salmonella inhibitor in processed poultry by-products. Technical Testing Agreement with Griffin Industries. 2010, \$11,802.
61. **C.W. Maddox**, K. Lascola (co-PIs), L.B. Borst, S.K. Patterson (coIs). Safety and efficacy of a strangles vaccine deleted in the CovS gene. United States Department of Agriculture-Hatch Program Funding. 2011-2012, \$41,174
62. **C.W. Maddox**, Ian Sweeney (Veterinary and MPH student) Exchange of virulence and resistance genes of *Staphylococcus* sp. infecting canine companions. Center for One Health Illinois - Capstone Research Program. August 2012 – December 2013. \$ 9,975
- 63 K. Lascola and **C. W. Maddox** 2012-2013 Response of Equine Monocytes to *Escherichia coli* O111:B4, O55:B5, or *Salmonella Typhimurium* LPS USDA – Hatch Program Funding. October 1, 21012 0 Sept. 30, 2013 \$15,314.

Grants since promoted to professor with tenure at UIUC

64. **C. W. Maddox** Variation in *Staphylococcus pseudintermedius* Exfoliative Toxin (siet) and the Severity of Canine Pyoderma Lesions James R. Harknes Funds. March 2013 – March 2014. \$ 6,500
65. **Maddox, C.W.** Role of M-protein in protection and virulence of *Streptococcus equi* subsp. *equi*. USDA NIFA FY2014 Hatch program. \$33,913
66. **Maddox, C.W.** Bruker MALDI-TOF Biotyper 50% Matching funds from the Office of the Vice Chancellor for Research. 25% CVM and 25% VDL. OVCR matching funds of \$105,750 awarded in December 2014

I. Review Panels

1. North Central Regional U.S. Geological Survey Proposals, 1998.
2. National Pork Producers Council, 1998-present.
3. Ad Hoc Reviewer for United States Department of Agriculture - National Research Initiative Competitive Grants Program, Section 32 (Food Safety), 1990-Present.

4. Ad Hoc Reviewer for United States Department of Agriculture - National Research Initiative Competitive Grants Program, Section 44 (Animal Protection), 1990-present.
5. National Institute of Health/National Institute for Allergies and Infectious Diseases Special Emphasis Panel Reviewer "Food and Waterborne Diseases Integrated Research Network," 2003.
6. United States Department of Agriculture - National Research Initiative Competitive Grants Program, Section 44 (Animal Protection) Panelist, 2004-2006.
7. UIUC Research Board Reviewer, November 2005 and March 2005.
8. United States Department of Agriculture - National Research Initiative Competitive Grants Program, Section 32.1 (Epidemiological Approaches to Food Safety) Panelist, 2007.

Reviews since promoted to professor with tenure at UIUC

9. AAAS Science and Technology Fellowship Applications – October 2014
10. The Wellcome Trust/ DBT India Alliance Fellowship Application – 2014
11. Kentucky Science & Engineering Foundation, Kentucky Science & Technology Corporation R&D Excellence Awards 5/13/12

II. PUBLICATIONS AND CREATIVE WORKS

#Denotes any publication derived from the candidate's thesis.

*Denotes publication that has undergone stringent editorial review by peers.

+Denotes publication that was invited and carries special prestige and recognition.

§Denotes publication of the graduate student for which Dr. Maddox was a thesis advisor.

A. Doctoral Thesis Title

#**C.W. Maddox.** Regulation of expression of *Escherichia coli* fimbrial antigen K88ab (F4), 1989.

B. Books Authored or Co-Authored (in print or accepted): None.

C. Books Edited or Co-Edited (in print or accepted): None.

D. Chapters in Books (in print or accepted)

- *1. L. Schultz, W. Fales, **C.W. Maddox** and J. Turk. 1997. Detection of the fimbrial gene F18 (F107) from swine enteritis *Escherichia coli*. In: *Mechanisms in the Pathogenesis of Enteric Diseases*, pp. 95-97, *Advances in Experimental Medicine and Biology*. (Vol. 412) ed. P.S. Paul, D.H. Francis, D.A. Benfield, Plenum Press, ISBN 0-306-45519-6.
- *2. **C.W. Maddox**, S.E. Baker, P.A. Dunn and A.E. Castro. 1997. Immunoglobulin response to *Salmonella enteritidis* outer membrane proteins. Use for evaluating infectious status. In: *Mechanisms in the Pathogenesis of Enteric Diseases*, pp. 89-92, *Advances in Experimental Medicine and Biology* (Vol. 412) ed. P.S. Paul, D.H. Francis, D.A. Benfield, Plenum Press, ISBN 0-306-45519-6.
- *3. **C.W. Maddox**, K. Kasemsuksakul, W.H. Fales, C. Besch-Williford, C.A. Carson and K. Wise. 1997. Unique *Salmonella choleraesuis* surface protein affecting invasiveness: Possible *inv* related sequence. In: *Mechanisms in the Pathogenesis of Enteric Diseases*, pp. 341-348, (Vol. 412) ed. P.S. Paul, D.H. Francis, D.A. Benfield, Plenum Press, ISBN 0-306-45519-6.
- *+4. **C.W. Maddox.** 2003. Salmonella detection methods. In: *Microbial Food Safety in Animal Agriculture: Current Topics*. Chapter 10, pp. 83-88, ed. R. Isaacson and M. Torrence, Iowa State Press, Ames, IA, ISBN 0-8138-1495-2.

E. Monographs (in print or accepted):

- + 1. Requisite scientific parameters for establishing the equivalence of alternative methods for pasteurization. NACMACF-Subcommittee on Redefining Pasteurization. 2006. *Journal of Food Protection* 69(5):1190-1216.

F. Articles in Journals (in print or accepted)*Articles Prior to Appointment at the UIUC*

- *1. **C.W. Maddox** and R.A. Wilson. 1986. High Tech Diagnostics: Detection of *Escherichia coli* Heat-Stable Enterotoxins Using DNA Probes. *J. Amer. Vet. Med. Assoc.* 188(1):57-59.
- *§2. **C.W. Maddox** and W.H. Fales. 1991. Use of a *Salmonella typhimurium* Derived *choleraesuis* Virulence Plasmids. *J. Vet. Diag. Invest.* 3:218-222.
- *3. L.W. Pace, J.M. Kreeger, M.A. Miller, S.E. Turnquist, J.R. Fischer, G.C. Johnson, J.R. Turk, L.L. Pittman, W.H. Fales, **C.W. Maddox**, A.A. Rottinghaus and H.S. Gosser. 1992. Necropsy Findings from Vietnamese Potbellied Pigs, 33 Cases. *J. Vet. Diag. Invest.* 4:351-352.
- *4. J.R. Turk, W.H. Fales, **C.W. Maddox**, M. Miller, L. Pace, J. Fischer, J. Kreeger, G. Johnson, S. Turnquist, J.A. Ramos and H.S. Gosser. 1992. Pneumonia Associated with *Salmonella choleraesuis* Infection in Swine: 99 Cases (1987-1990) *J. Amer. Vet. Med. Assoc.* 201(10):1615-1617.
- *5. G.E. Duhamel, R.A. Moxley, **C.W. Maddox** and E.D. Erickson. 1992. Enteric Infection of a Goat with Enterohemorrhagic *Escherichia coli* (O103:H2). *J. Vet. Diag. Invest.* 4:197-200.
- §6. J.R. Fischer, **C.W. Maddox**, R. Moxley, D. Kinden and M.A. Miller. 1994. Pathogenicity of a Bovine Attaching Effacing *Escherichia coli* Isolate Lacking Shiga-like Toxins. *Amer. J. Vet. Res.* 55(7):991-999.
- *7. G.C. Johnson, W.H. Fales, **C.W. Maddox** and J.A. Ramos-Vara. 1995. Evaluation of Laboratory Tests for Confirming the Diagnosis of Encephalitic Listeriosis in Ruminants. *J. Vet. Diag. Invest.* 7:223-228.
- *8. G.C. Johnson, **C.W. Maddox**, W.H. Fales, W.A. Wolff, R.F. Randale, J.A. Ramos, H. Schwartz, K.M. Heise, A.L. Baetz, I.V. Wesley and D.E. Wagner. 1996. Epidemiologic Evaluation of Encephalitic Listeriosis in Goats. *J. Am. Vet. Med. Assoc.* 208(10):1695-1699.
- *9. P.L. White, W. Schlosser, C.E. Benson, **C.W. Maddox** and A. Houge. 1997. Environmental Survey by Manure Drag Sampling for *Salmonella enteritidis* in Chicken Layers. *J. Food Protection* 60(10):1189-1193.
- *10. J. Turk, **C.W. Maddox**, W.H. Fales, L. Schultz, M. Miller, G. Johnson, L. Pace, S.E. Turnquist and J. Kreeger. 1998. Diarrhea Associated with Attaching Effacing *Escherichia coli* in Dogs: 44 Cases (1992-1996). *J. Am. Vet. Med. Assoc.* 212(11):1735-1736.
- *11. J.P. Gray, **C.W. Maddox**, P.T. Tobin and C.W. Pitts. 1999. Vector Competence of *Carcinops pumilio* (Erichson) (Coleoptera:Histeridae) for *Salmonella enteritidis* (Gaertner) (Eubacteriales:Enterobacteriaceae) *J. Med. Entomology* 36(6):888-891.

Articles in journals since appointed clinical associate professor at UIUC.

- *§12. S. Zhang and **C.W. Maddox**. 2000. Cytotoxic activity of coagulase negative staphylococci in bovine mastitis. *Infection and Immunity* 68(3):1102-1108.
- *13. C. DebRoy and **C.W. Maddox**. 2001. Assessing virulence of gastroenteric *Escherichia coli* isolates of veterinary significance. *Animal Health Research Reviews* 1(2):129-140.
- *14. A. Farhat, **C.W. Maddox**, M.E. Edwards, M.H. Costell, J.A. Hadley and R. Vasilatos-Younken. 2002. Oral lavage with polyethylene glycol reduces microbial colonization in the gastrointestinal tract of broilers. *Poultry Science* 81:585-589.
- *15. R.S. Singer, S. Patterson, A. Meier, J. Gibson, H. Lee, and **C.W. Maddox**. 2004. Relationship between phenotype and genotype florfenicol resistance in *Escherichia coli*. *Antimicrobial Agents and Chemotherapy* 48(10):4047-4049.

- *16. N.V. Hegde, M.L. Cook, D.R. Wolfgang, B.C. Love, **C.W. Maddox** and B.M. Jayaro. 2005. Dissemination of *Salmonella enterica* subsp. *enterica* serovar Typhimurium var. Copenhagen clonal types through a contract heifer-raising operation. *Journal of Clinical Microbiology* 43(8):4208-4211.
- *17. J.R. Middleton, W.H. Fales, C.D. Luby, J.L. Oaks, S. Sanchez, J.M. Kinyon, C.C. Wu, **C.W. Maddox**, R.D. Welsh, and F. Hartmann. 2005. Surveillance of *Staphylococcus aureus* in veterinary teaching hospitals. *Journal of Clinical Microbiology* 43(6):2916-2919.
- *18. A.P. Rooney, J.L. Swezey, R. Friedman, D.W. Hecht and **C.W. Maddox**. 2006. Analysis of core housekeeping and virulence genes reveals cryptic lineages of *Clostridium perfringens*. *Genetics* 172:2081-2092.
- *19. C.L. Cooke, R.S. Singer, **C.W. Maddox** and R. Isaacson. 2006. The use of pooled samples and PCR for the detection of salmonella in feces. *Journal of Veterinary Diagnostic Investigation* 18:319-325.
- * 20. D.M. Nucera, **C.W. Maddox**, P. Hoiem-Dalen and R.M. Weigel. 2006. Comparison of API 20E and *invA*-PCR for identification of *Salmonella enterica* in isolates from swine production units. *Journal of Clinical Microbiology* 44(9):3388-3390.

Since promotion to associate professor with tenure at UIUC.

- *21. S. Rao, **C.W. Maddox**, P. Hoiem-Dalen, S. Lanka, R.M. Weigel. 2007. Diagnostic accuracy of a class 1 integron PCR method in detection of antibiotic resistance in Salmonella isolated from swine production systems. *Journal of Clinical Microbiology* 46:916-920.
- 22. B. Payne, S. Clark, **C. Maddox**, A. Ness. 2008. *Achromobacter xylosoxidans*: Causative agent of reproductive failure in artificially inseminated sows and gilts. *Journal of Swine Health and Production* 16(6):316-322.
- *23. J. Marrow, J. Whittington, M. Mitchell, L. Hoyer, **C. Maddox**. 2009. *Enterococcus sp.*: Prevalence and antibiotic resistance characteristics in wild raptors. *Journal of Wildlife Diseases* 45(2):302-313.
- *24. A. Labelle, R. Hamor, A. Barger, **C. Maddox**, C. Breaux. 2009. *Aspergillus flavus* keratomycosis in a cat treated with topical 1% voriconazole solution. *Veterinary Ophthalmology* 12(1): 48-52.
- *25. A. MacNeill, J.C. Steeil, O. Dossin, P.S. Hoiem-Dalen, **C. W. Maddox**. 2010. Disseminated nocardiosis caused by *Nocardia abscessus* in a dog: First reported case. *Veterinary Clinical Pathology* 39(3):381-385.
- *26. C. Metry, P.S. Hoiem-Dalen, **C.W. Maddox**, E.H. Thompson, D. A. Sutton, A.M. Romanelli, B. L. Wickes, A.L. MacNeill. 2010. Subcutaneous *Mycocleptodiscus* infection in an immunosuppressed dog. *Journal of Clinical Microbiology* 48(8):3008-3011.
- §*27. S. Lanka, L. Borst, S. Patterson, **C. Maddox**. 2010. A multiphasic typing approach to subtype *Streptococcus equi* subspecies *equi*. *Journal of Veterinary Diagnostic Investigation* 22(6):928-936.
- §*28. L. Borst, S.K. Patterson, S. Lanka, A.M. Barger, R.L. Fredrickson, **C. W. Maddox**. 2011. Evaluation of a commercially available modified-live *Streptococcus equi* subsp, *equi* vaccine in ponies. *American Journal of Veterinary Research* 72:1130-1138.
- *29. M. C. Allender, M. Dreslik, S. Baker, C. Phillips, **C. Maddox**, M. Delaney, M. Kinsel. 2011. An unusual mortality event associated with *Chrysosporium* in the Eastern Massasauga (*Sistrurus catenatus catenatus*). *Emerging Infectious Diseases* 17(12):2383-2384.
- §*30. L.B. Borst, S.K. Patterson, S. Lanka, M.M. Suyemoto, **C.W. Maddox**. 2011 Zebrafish (*Danio rerio*) as a screen for attenuation of Lancefield group C streptococci and a model for streptococcal pathogenesis. *Veterinary Pathology* 2011 Oct 12 PMD 21997564 (Epub).
- *31. C. Metry, **C. Maddox**, L. Dirikolu, Y. Johnson, K. Campbell. 2012. Determination of enrofloxacin stability and in vitro efficacy against *S. pseudintermedius* and *P. aeruginosa* in four ear cleaner solutions over a 28 day period. *Veterinary Dermatology* 23(1):23-8.
- *32. Katherine R Jones, Clark-Price, Stuart Charles; **Maddox, Carol W**; Ridgway, Marcella D., Dossin Olivier. 2013, Incidence of bacteremia during upper gastrointestinal endoscopy and

biopsy collection in healthy dogs before, during and after treatment with omeprazole". *American Journal of Veterinary Research* 74(2): 239-242

- *33. Song, M., Y. Liu, J.A. Soares, T.M. Che, O/ Osuna, **C.W. Maddox**, J.E. Pettigrew. 2012 Dietary clays alleviate diarrhea of weaned pigs. *Journal of Animal Science* 90:345-360

Since promotion to full professor with tenure at UIUC.

- *34. A. Labelle, **C.W. Maddox**, J. B. Daniels, S. Lanka, T. Eggett, R.R. Dubielzig, R. Hamor, P. Labelle. 2013 Canine ocular onchocerca in the United State is associated with *Onchocerca lupi*. *Veterinary Parasitology* 193(1-3):297-301
- *35. Liu, Y., M. Song, T. M. Che D. Bravo, **C. W. Maddox**, and J. E. Pettigrew. 2013 Effects of capsicum oleoresin, garlic botanical, and turmeric oleoresin on gene expression profile of ileal mucosa in weaned pigs. *J Animal Science*. 91(11):5294-306
- *36. Chan CM, Ridgway MD, Mitchell MA, **Maddox CW**. 2013 Association between Mycoplasma-specific polymerase chain reaction assay results and oral bacterial contamination of bronchoalveolar lavage fluid samples from dogs with respiratory tract disease – 121 cases (2005-2012). *J Am Vet Med Assoc*. 2013 Dec. 1; 243(11):1573-937.
- *37. Santoro, D, **Maddox, C.W.** 2013 Canine antimicrobial peptides are effective against resistant bacteria and yeast. *Vet. Dermatol*. 2013 Nov. 12 doi: 10.1111/vde.12091 (Epub ahead of print)
- *38. Almeida, J.S., Liu, Y., Song, M., Lee, J.J., Gaskins, H.R., **Maddox, C.W.**, Osuna, O., and Pettigrew, J.E. Escherichia coli challenge and one type of smectite alter intestinal barrier of pigs. 2013. *J. of Animal Science and Biotechnology* Dec. 2013; 4(1):52.
- *39. Jennifer A. Landolfi, Michele Miller, **Carol Maddox**, Federico Zuckermann, Jennifer N. Langan, and Karen A. Terio. 2014 “Differences in immune cell function between tuberculosis positive and negative Asian elephants” *Tuberculosis* 2014 Jul; 94(4):374-82
- *40. Anne M Barger, G Robert Weedon, **Carol W Maddox**, Kimberly A Galloway 2014 *Dermatophilus congolensis* in a feral cat. *Journal of Feline Medicine and Surgery*. October 2014; Vol. 16, 10: pp. 840-841
- *41. MacNeill AL, Barger AM, Skowronski MC, Lanka S, Maddox CW 2015 Identification of *Cytauxzoon felis* infection in domestic cats from southern Illinois. *J Feline Med Surg*. 2015 Jan 19. pii: 1098612X14567158. [Epub ahead of print] PMID:25600081
- *42. Allender MC, Bunick D, Dzhaman E, Burrus L, Maddox C. Development and use of a real-time polymerase chain reaction assay for the detection of *Ophidiomyces ophiodiicola* in snakes. *J Veterinary Diagnostic Investigation*. 2015 Mar;27(2):217-20
- *43. Amanda C. Dolinski, Matthew C. Allender, Vincent Hsiao, Carol W. Maddox Systemic *Ophidiomyces ophiodiicola* infection in a free-ranging plains garter snake (*Thamnophis radix*) *Journal of Herpetological Medicine and Surgery* 2015 (in press)

G. Creative Works (Exhibitions, Commissions, Competitions, Performances, Art or Architecture Executed): None.

H. Bulletins, Reports or Conference Proceedings (in print or accepted)

Bulletins, Reports or Conference Proceedings Prior to Appointment at UIUC.

1. C.M. Wolfgang (maiden name for **C.W. Maddox**) and H. Rothenbacher. 1978. Equine Internal Parasitism Controls and Treatment Given. *Science in Agriculture* (Penn State University Agriculture Research Publication) 25(2):7.
2. R.A. Wilson and **C.W. Maddox**. 1983. Use of ELISA, Amplified ELISA and c-ELISA to Detect K99 Antigens Using Monoclonal Antibodies. 64th Annual Conference for Research Workers in Animal Diseases. Chicago, IL.
3. **C.W. Maddox** and R.A. Wilson. 1984 Correlations Between Colony Blot Hybridization and In

- vivo Assays for *Escherichia coli* Heat-Stable Toxins. 65th Annual Conference for Research Workers in Animal Diseases. Chicago, IL.
4. **C.W. Maddox**, C. Konosics and R.A. Wilson. 1988. Practical Approaches to DNA Probes. Nucleic Acids Probes in Veterinary Infectious Diseases, pg. 22. 3rd Workshop of the American College of Veterinary Microbiologists. Ames, IA.
 5. R.A. Wilson, **C.W. Maddox**, and T.S. Whittam. 1988. Application of Gene Probe Analysis and Multilocus Enzyme Electrophoresis to Diagnostics and Research. Nucleic Acid Probes in Veterinary Infectious Diseases, pg. 19. 3rd Workshop of the American College of Veterinary Microbiologists. Ames, IA.
 6. **C.W. Maddox** and W.H. Fales. 1990. Use of a *Salmonella typhimurium* Derived Virulence Gene Probe in the Detection of Salmonellosis and Characterization of *S. Cholerae-suis* Virulence Plasmids. 33rd Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. Denver, CO.
 7. J.R. Turk, W.H. Fales, M.A. Miller, L.P. Pace, **C.W. Maddox**, J.R. Fischer, G.C. Johnson, S.E. Turnquist, J.M. Kreeger, L. Pittman and H.S. Gosser. 1991. Correlation of Bacteriologic Findings with Turbinate Scores in Swine with Atrophic Rhinitis. 32nd North Central Conference of Veterinary Laboratory Diagnosticians. Lincoln, NE.
 8. W.H. Fales, **C.W. Maddox**, J.O. Wilbers, J.R. Turk, M.A. Miller, L.P. Pace, J.M. Kreeger, G.C. Johnson, J.R. Fischer, S.E. Turnquist and H.S. Gosse. 1991. Antimicrobial Susceptibility of *Salmonella cholera-suis* from Missouri Swine. 32nd North Central Conference of Veterinary Laboratory Diagnosticians. Lincoln, NE.
 9. L.W. Pace, J.M. Kreeger, M.A. Miller, S.E. Turnquist, J.R. Fischer, G.C. Johnson, J.R. Turk, L.L. Pittman, W.H. Fales, **C.W. Maddox**, A.A. Rottinghaus and H.S. Gosser. 1991. Necropsy Findings from Vietnamese Potbellied Pigs, Thirty-three Cases, Veterinary Medical Diagnostic Laboratory, University of Missouri-Columbia. 34th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. San Diego, CA.
 10. W.H. Fales, **C.W. Maddox**, M.A. Dollar, J.R. Turk, M.A. Miller, L.W. Pace, J.M. Kreeger, G.C. Johnson, J.R. Fischer, S.E. Turnquist, L.L. Pittman and H.S. Gosser. 1991. Antimicrobial Susceptibility of *Bordetella bronchiseptica* Recovered from Missouri Swine. 34th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. San Diego, CA.
 11. **C.W. Maddox**, M.A. Miller, W.H. Fales, L.M. Schultz, A.A. Rottinghaus, M.A. McDonald, J.R. Fischer, G.C. Johnson, J.M. Kreeger, L.W. Pace, L.L. Pittman, J.R. Turk, S.E. Turnquist and H.S. Gosser. 1991. In vitro Adherence and Invasive Assays as an Indication of Virulent Non-Enterotoxigenic *E. Coli* Isolates from Calves with Enteritis. 34th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. San Diego, CA.
 12. J.R. Turk, **C.W. Maddox**, W.H. Fales, L.M. Schultz, J.R. Fischer, G.C. Johnson, K.M. Kreeger, M.A. Miller, L.W. Pace, L.L. Pittman, S.E. Turnquist and H.S. Gosser. 1991. Histopathologic Correlation of Pathogenic Factors in Enteric Colibacillosis of Missouri Swine During 1990. 34th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. San Diego, CA.
 13. W.H. Fales, **C.W. Maddox**, J.R. Turk, M.A. Miller, L.W. Pace, J.M. Kreeger, G.C. Johnson, J.R. Fischer, S.E. Turnquist, L.L. Pittman and H.S. Gosser. 1992. Antimicrobial Susceptibility of *Salmonella cholerae-suis* from Missouri Swine. Vith International Symposium of the World Association of Veterinary Laboratory Diagnosticians. Lyon, France.
 14. J.R. Fischer, M.A. Miller, R.A. Moxley, L.M. Schultz and **C.W. Maddox**. 1992. Detection and Characterization of Non-Enterotoxigenic *Escherichia coli* in Calves with Diarrhea. 35th Annual Meeting of American Association of Veterinary Laboratory Diagnosticians. Louisville, KY.
 15. J.R. Turk, G.C. Johnson, **C.W. Maddox**, W.H. Fales, M.A. Miller, J.M. Kreeger, L.W. Pace, L.L. Pittman, S.E. Turnquist, K.L. Bailey, A. Rottinghaus and H.S. Gosser. 1993. *Cryptosporidium* and Intercurrent Infectious Agents in Calhhood Diarrhea in Missouri. 36th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. Las Vegas, NV.

16. **C.W. Maddox** and J.B. Addison. 1994. A Direct ELISA for *Moraxella bovis* Pili: Correlation Between Vaccine Pilus Concentration and Protection of Vaccinated Cattle. 75th Annual Conference of Research Workers in Animal Diseases. Chicago, IL.
 17. G.C. Johnson, **C.W. Maddox**, W.H. Fales, R. Randle, J.A. Ramos-Vara, A.L. Baetz, I.V. Wesley and D. Wagner. 1994. The Occurrence and Diagnosis of Listeriosis in Angora Goats. 11th International Symposium of the World Association of Veterinary Laboratory Diagnosticians. Buenos Aires, Argentina.
 18. W.M. Sischo, C.W. Heald, **C.W. Maddox**, T. Kim, J.B. Cooper and C.M. Burns. 1995. Validating a Mastitis Control System. 38th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. Reno, NV.
 19. S.E. Baker and **C.W. Maddox**. 1996. Immunoglobulin Response to *Salmonella enteritidis* Outer Membrane Proteins: Use for Evaluating Infectious Status. American Society of Microbiology 96th General Meeting. New Orleans, LA.
 20. D. Weinstock, A.L. Hattel, T.R. Drake, S.E. Myers, S.L. Brusco and **C.W. Maddox**. 1997. Severe Gastroenteritis in Calves due to *Escherichia coli* with CS31A Adhesin and Cytonecrotizing Factors. 40th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians, Histopathology Slide Conference. Louisville, KY.
 21. **C.W. Maddox**, W.H. Fales, D.G. White, and R.A. Wilson. 1997. The Role of *Escherichia coli* CS31A Adhesin and Cytonecrotizing Factors 1 and 2 in Septicemic Colibacillosis of Juvenile Bovines. 78th Annual Conference for Research Workers in Animal Diseases. Chicago, IL.
 22. S. Zhang and **C.W. Maddox**. 1997. Adherence and Cytotoxic Effects of Coagulase Negative Staphylococcus Bovine Mastitis Isolates to Hep-2 Cells. 78th Annual Conference of Research Workers in Animal Diseases. Chicago, IL.
 23. S.E. Myers and **C.W. Maddox**. 1998. Surveillance for Salmonella: An Integral Part of Pre-Harvest Food Safety Programs. Pennsylvania Animal Diagnostic Laboratory System Spring Conference, UP-NBC. Kennett Square, PA.
 24. **C.W. Maddox**, A. Hattel and T. Drake. 1998. Potential role of Beta 2 Toxin of *Clostridium perfringens* Type A in necrotic enteritis of adult dairy cows. 41st Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. Minneapolis, MN.
 25. **C.W. Maddox**. 1999. How to Best Utilize Minimal Inhibitory Concentration (MIC) Data. 117th Annual Pennsylvania Veterinary Medical Association Scientific Meeting. Lancaster, PA.
 26. **C.W. Maddox** and B. Jayaro. 1999. Optimize Recovery of Newly Emerging Etiological Agents and Improve the Diagnostic Value of Your Submission and a Systemic Approach to Identifying Streptococcus Species in Clinical Samples. 117th Annual Pennsylvania Veterinary Medical Association Scientific Meeting. Lancaster, PA.
 27. **C.W. Maddox**, A. Hattel, T. Drake and D. Weinstock. 1999. *Clostridium perfringens* Type A Strains Recovered from Acute Hemorrhagic Enteritis of Adult Dairy Cattle. 42nd Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. San Diego, CA.
 28. **C.W. Maddox**, J. Gray, T. Petty Jr., J. Sobota, A. Castro and C. Pitts. 1999. Detection of Avian Influenza in *Carcinops pumilo*, a Beetle Used for Fly Control in Layer Houses. 42nd Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. San Diego, CA.
 29. S. Myers, **C.W. Maddox** and D. Henzler. 1999. Assessing the Risks of Poultry Flocks Shedding *Salmonella enteritidis* in Eggs. 42nd Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. San Diego, CA.
- Bulletins, Reports or Conference Proceedings Since Appointed Clinical Associate Professor at UIUC.*
30. **C.W. Maddox**. 2001. Defining pathogens: A vital role in biosecurity (on DVD). 82nd Annual Conference for Veterinarians. College of Veterinary Medicine, Urbana, IL.
 31. **C.W. Maddox**, K. Englehart, Y. Zhang, S. Myers, A. Hattel and C. DeRoy. 2001. Genotypic variation among *Clostridium perfringens* isolates recovered from hemorrhagic enteritis of adult dairy cattle. 82nd Annual Conference for Research Workers in Animal Diseases. St. Louis, MO.

32. P. Laski, G. Scherba and **C.W. Maddox**. 2002. An improved mycoplasma detection assay, pg. 74. 45th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. St. Louis, MO.
33. P. Laski, **C.W. Maddox** and G. Scherba. 2002. A simplified multiplex RT-PCR assay for the differentiation between North American, European and vaccine strains of porcine reproductive and respiratory syndrome virus (PRRSV), pg. 26. 45th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. St. Louis, MO.
34. **C.W. Maddox**. 2002. Utilizing MIC Results to Optimize Antimicrobial Therapy (on DVD). 83rd Annual Fall Conference for Veterinarians. College of Veterinary Medicine, Urbana, IL.
35. H.F. Troutt, **C.W. Maddox**, A. Hubner, A. Stevenson, L. Deem and D. Schaeffer. 2004. Selected foodborne and other pathogens in immediate products of rendering. Animal Feeds Workshop on Bacterial Contamination of Animal Feeds and the Human Health Consequences. Centers for Disease Control, Atlanta, GA.
36. M. Birchen, P. Laski, A. Stevenson, S. Lanka and **C.W. Maddox**. 2004. Comparison of DNA extraction methods for detection of *Mycoplasma sp.* in porcine lungs. American Association of Swine Veterinarians, Perry, IA.
37. **C.W. Maddox**. 2005. Leptospirosis Update: Re-emergence? pg. 184-195. 86th Annual Fall Conference for Veterinarians. College of Veterinary Medicine, Urbana, IL.
38. C.A. Lichtensteiger, **C.W. Maddox**, C.F. Shipley and V.E. Bayer. 2005. Leptospirosis in a farmed deer. Histopathology Slide Seminar (pg. 10). 48th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. Hershey, PA.
39. H.F. Troutt, **C.W. Maddox**, A. Hubner, A. Stevenson, L. Deem and D. Schaeffer. 2006. Selected foodborne and other pathogens in the immediate products of rendering. XXIVth World Buiatrics Congress. Nice, France.

I. Abstracts (in print or accepted)

Dr. Maddox had 7 abstract in print prior to her appointment at UIUC.

1. W.H. Fales, **C.W. Maddox**, J.O. Wilbers, J.R. Turk, M.A. Miller, L.P. Pace, J.M. Kreeger, G.C. Johnson, J.R. Fischer, S.E. Turnquist and H.S. Gosser. 1990. Antimicrobial Susceptibility of *Salmonella cholerae-suis* from Missouri Swine. 33rd Meeting of the American Association of Veterinary Laboratory Diagnosticians. Denver, CO.
2. **C.W. Maddox** and A.A. Rottinghaus. 1990. Hep-2 Cell Adherence and Invasion by Enteropathogenic *Escherichia coli* Isolates from Calves and Piglets, pg 1. Microbial Adhesion and Invasion Symposium. Panama City, FL.
3. W.H. Fales, **C.W. Maddox**, J.O. Wilbers, J.R. Turk, M.A. Miller, L.P. Pace, J.M. Kreeger, G.C. Johnson, J.R. Fischer, S.E. Turnquist and H.S. Gosser. 1990. Antimicrobial Susceptibility of *Salmonella cholerae-suis* from Missouri Swine. 71st Annual Conference for Research Workers in Animal Diseases. Chicago, IL.
4. **C.W. Maddox**, A.A. Rottinghaus, W.H. Fales and M.A. Miller. 1990. Hep-2 Cell Adherence and Invasion by Enteropathogenic *Escherichia coli* Isolates from Calves and Piglets. Poster Presentation. 71st Annual Conference for Research Workers in Animal Diseases. Chicago, IL.
5. W.H. Fales, **C.W. Maddox**, J.O. Wilbers, J.R. Turk, M.A. Miller, L.P. Pace, J.M. Kreeger, G.C. Johnson, J.R. Fischer, S.E. Turnquist and H.S. Gosser. 1990. Antimicrobial Susceptibility of *Salmonella cholerae-suis* from Missouri Swine. Poster Presentation. 71st Annual Conference of Research Workers in Animal Diseases. Chicago, IL.
6. W.H. Fales, **C.W. Maddox**, M.A. Dollar, J.R. Turk, M.A. Miller, L.W. Pace, J.M. Kreeger, G.C. Johnson, J.R. Fischer, S.E. Turnquist, L.L. Pittman and H.S. Gosser. 1991. Antimicrobial Susceptibility of *Bordetella bronchiseptica* Recovered from Missouri Swine. 72nd Annual Conference for Research Workers in Animal Disease. Chicago, IL.

7. S.L. Brusio, S.M. Gerber, C.W. Heald, W.M. Sischo, D. Wolfgang and **C.W. Maddox**. 996. Characterization of Potential Virulence Factors Contributing to Coagulase Negative Staphylococcus Mastitis. 39th Meeting of the American Association of Veterinary Laboratory Diagnosticians. Little Rock, AR.

Abstracts since Appointed Clinical Associate Professor at UIUC.

8. M. Birchen, **C.W. Maddox**, A. Stevenson, R. Zhang and P. Laski. 2001. A DNA amplification assay for detection of *Mycoplasma sp.* in bulk tank milk. 82nd Annual Conference for Research Workers in Animal Diseases. St. Louis, MO.
9. P. Laski, **C.W. Maddox** and G. Scherba. 2002. General scheme for designing a reliable internal control for nucleic acid amplification. Poster Presentation, 45th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. St. Louis, MO.
10. **C.W. Maddox**, S. Lanka, J.A. Croix, I. Kakoma, R. Singer and T. Goldberg. 2004. Cephalosporin resistance in *Campylobacter coli* from swine. Poster for Session 291 #Z-037 of the American Society for Microbiology General Meeting. New Orleans, LA.
- §11. L. Borst, S. Lanka, R. Weigel, R. Singer and **C.W. Maddox**. 2004. *Streptococcus equi* subsp. *equi* PFGE genotype predicted by glycogen, 3-me glucose, psicose and me-pyruvate substrate utilization: hierarchical cluster analysis of pathotypes. Poster for Session 054 #Z-014 of the American Society for Microbiology General Meeting. New Orleans, LA.
- §12. S. Lanka, C. DebRoy, J.A. Croix, L. Borst and **C.W. Maddox**. 2004. Genotypic variation among multiple antibiotic resistant (MAR) *Salmonella enteritica* Typhimurium and Newport serovars from PA and IL dairy cattle. Poster for Session 291 #Z-039 of the American Society for Microbiology General Meeting. New Orleans, LA.
13. S. Patterson, **C.W. Maddox** and R.S. Singer. 2004. Molecular characterization of antibiotic resistance genes carried on plasmids over time on a single dairy. Poster for Session 024A #A042 at the American Society for Microbiology General Meeting. New Orleans, LA.
- +§14. L. Borst and **C.W. Maddox**. 2004. A quantitative real time PCR assay for the detection of pathogenic *Leptospira spp.* in the urine of canine companions and wildlife. Student Chapter of the American Veterinary Medical Association - poster competition winner, National American Veterinary Medical Association Meeting. Philadelphia, PA.
15. A.P. Rooney, R. Friedman, D.W. Hecht and **C.W. Maddox**. 2005. Patterns of genetic variability in the coding and 3' flanking regions of the alpha-toxin gene in *Clostridium perfringens*. Poster Abstract #255 of the American Society for Microbiology General Meeting. Atlanta, GA.
16. E.L. Freiburger, **C.W. Maddox** and R.S. Singer. 2005. The prevalence of antimicrobial resistance in anaerobic bacteria of dairy cattle. Poster Abstract #258 of the American Society Microbiology General Meeting. Atlanta, GA.
17. L.I. Cheng, J.J. Andrews, R.L. Fredrickson and **C.W. Maddox**. 2005. Leptospirosis associated abortion in two mares. North Central Conference of Veterinary Laboratory Diagnosticians. Fargo, ND.
18. L.I. Cheng, J.J. Andrews, R.L. Fredrickson and **C.W. Maddox**. 2005. Leptospirosis associated abortion in two mares, pg. 171. American Association of Veterinary Laboratory Diagnosticians. Hershey, PA.
- §19. S.K. Patterson, L.B. Borst, P. Hoiem-Dalen, S. Lanka and **C.W. Maddox**. 2006. A method for rapid differentiation and comparison of virulence gene sequences of *Streptococcus equi*. Poster for Session #B-164 American Society for Microbiologists General Meeting. Orlando, FL.
20. S. Rao, **C.W. Maddox**, P. Hoiem-Dalen, S. Lanka and R.M. Weigel. 2006. Class 1 integron detection and genotyping of *Salmonella spp.* isolated from swine production systems. Poster for Session #A-4843 American Society for Microbiologists General Meeting. Orlando, FL.

Abstracts since promotion to associate professor with tenure at UIUC.

21. C.A. Lichtensteiger, D. Mensching, L.B. Borst, **C.W. Maddox**, A.K. Stevenson, S. Lanka, P.A. Volmer, B. Wilson. 2007. Farm outbreak of non-*Clostridium botulinum* associated botulism in horses. Proceedings of the 46th Annual North Central Conference of Veterinary Laboratory Diagnosticians. Ames, IA.
22. C.A. Lichtensteiger, D. Mensching, L.B. Borst, **C.W. Maddox**, A.K. Stevenson, S. Lanka, P.A. Volmer, B. Wilson. 2007. Farm outbreak of non-*Clostridium botulinum* associated botulism in orses. Proceedings of the 50th Annual Meeting of the American Association for Veterinary Laboratory Diagnosticians. Reno, NV.
23. M.S. Myint, Y.J. Johnson, C.W. **Maddox**, J.A. Herrmann, J.I. Ha, H.F. Troutt. 2007. Risk factors for bacterial contamination of meat and poultry purchased at the retail grocery outlets. Conference for Research Workers in Animal Diseases. Chicago, IL.
24. Y.J. Johnson, M.S. Myint, J.A. Herrmann, A. Mathewson, H.F. Troutt, **C.W. Maddox**. 2007. Preliminary findings on the prevalence of methicillin-resistant *Staphylococcus* species in healthy horses and their human contacts. Conference for Research Workers in Animal Diseases. Chicago, IL.
- §25. S. K. Patterson, L. Borst, **C.W. Maddox**. 2008. M-like protein encoded by *szp* is a virulence factor of *Streptococcus equi* ssp *equi*. Poster #B-356 American Society for Microbiology General Meeting. Boston, MA.
26. P.S. Hoiem-Dalen, T. Eggett, **C.W. Maddox**. 2008. Application of molecular techniques for fungal identification. Proceedings of the 47th Annual North Central Conference of Veterinary Laboratory Diagnosticians. Madison, WI.
27. **C.W. Maddox**. 2008. More on strangles vaccination. DVD 89th Annual Fall Conference for Veterinarians. UIUC.
- §28. S. Lanka, L. Borst, S. Patterson, **C. Maddox**. 2008. A multiphasic approach to subtype *Streptococcus equi* subspecies *equi*. pg. 164 American Association of Veterinary Laboratory Diagnosticians 51st Annual Conference, Greensboro, NC.
29. V. Perez, J. Pettigrew, **C. Maddox**, J. Pluske, J. Barnes, J. Eugene. 2009. Changes in diversity and homogeneity of the gut microbiota of pigs fed distillers dried grains with solubles (DDGS) after an *E. coli* challenge. Abstract #32190 Joint Annual Meeting of the American Society for Animal Science and American Dairy Science Association, Montreal, Quebec, Canada.
30. V. Perez, J. Pettigrew, **C. Maddox**, R. Fredrickson, J. Pluske. 2009. Dietary distiller dried grains with solubles (DDGS) on gut physiology and gut histopathology of newly weaned pigs with a pathogenic *E. coli*. Digestive Physiology of Pigs International Symposium, Costa Daurada, Spain.
31. V. Perez, J. Pettigrew, **C. Maddox**, J. Pluske. 2009. Dietary distiller dried grains with solubles (DDGS) on health status and fecal coliforms of newly weaned pigs infected with a pathogenic *E. coli*. Digestive Physiology of Pigs International Symposium, Costa Daurada, Spain.
32. V. Perez, **C. Maddox**, G. Fahey, J. Pluske, J. Pettigrew. 2010. Insoluble dietary fiber hastened the recovery from colibacillosis diarrhea in pigs after weaning. Midwest Section of the American Society for Animal Science, Des Moines, IA.
33. Song, M., J.A. Soares, Y. Liu, O. Osuna, **C.W. Maddox**, J.E. Pettigrew. 2010. Effect of dietary clay on diarrhea of weaned pigs experimentally infected with a pathogenic *E. coli*. Midwest Section of American Society for Animal Science, Des Moines, IA.
34. K. Jones, O. Dossin, S. Clark-Price, **C. Maddox**. 2010. Incidence of bacteremia following gastric and duodenal endoscopic biopsies before and after treatment with omeprazole in healthy dogs. American College of Veterinary Internal Medicine National Meeting, Anaheim, CA.
35. K. Grimm, N. Mateus-Pinilla, **C. Maddox**, S. Fredebaugh, N. Rivera, H-Y. Wen. 2010. Risk of leptospirosis in wildlife: A measure of ecosystem health. Morris Animal Foundation Meeting, Seattle, WA.

36. C.A. Metry, **C.W. Maddox**, L. Dirikolu, K.L. Campbell, Y.J. Johnson. 2010. Determination of enrofloxacin stability in four ear cleaner solutions for topical treatment of otitis externa. North American Veterinary Dermatology Forum, Portland, OR.
37. Y. Liu, M. Song, T.M. Che, J.A. Soares, D. Bravo, **C.W. Maddox**, and J.E. Pettigrew. 2011. Effects of plant extracts on peripheral blood immune cells and inflammatory mediators of weaned pigs experimentally infected with a pathogenic *E. coli*. Joint Annual Meeting of the American Society for Animal Science & American Dairy Science Association, New Orleans, LA.
38. Z. Westrick, K. Singh, S. Patterson, T. Eggett and **C. Maddox**. 2011. Detection and differentiation of canine lymphoma using quantitative PCR. 2011 Meril-NIH National Veterinary Scholars Symposium, Orlando, FL.
39. S. Lanka, V. Perez, J. Pettigrew, **C. Maddox**. 2011. Quantitative assessment of adherent bacteria in porcine intestines. Poster American Association for Veterinary Laboratory Diagnosticians National Meeting, Buffalo, NY. p. 164.
40. S.K. Patterson, L.B. Borst and **C.W. Maddox**. 2011. Regulation of *Streptococcus equi* subspecies *equi* by the control of virulence sensor, *covS*. American Association for Veterinary Laboratory Diagnosticians National Meeting, Buffalo, NY. p. 81.
41. A.L. Labelle, **C.W. Maddox**, J.B. Daniels, T.E. Eggett, R.R. Dubielzig, P. Labelle. 2011. Molecular identification of *Onchocerca lupi* from feline and canine ocular tissue of U.S. origin. American College for Veterinary Ophthalmology, Hilton Head, SC.
42. Y. Liu*, M. Song, T. M. Che, J. A. Soares-Almeida, J. J. Lee, D. Bravo, **C. W. Maddox**, J. E. Pettigrew.. 2012. Effects of feeding capsicum oleoresin, garlison, or turmeric oleoresin on gene expression of ileal mucosa of pigs. ADSA-AMPA-ASAS Joint Annual Meeting, Phoenix, AZ.
43. Vincent Hsiao, Miranda O'Dell, Lucienne Burris, Sara Lanka, Therese Eggett, Matt Allender, **Carol Maddox**. 2012. Chryso sporium sp., a potentially emerging pathogen of snakes. North Central Conference for Veterinary Laboratory Diagnosticians, Urbana, IL.
44. Matt Allender, Michael J. Dreslik, Christopher A. Phillips, **Carol Maddox**. 2012. Facial disfiguration syndrome in free-ranging snakes throughout the eastern US: An emerging pathogen associated with Chryso sporium . American Association of Zoo Veterinarians Conference, Oakland, CA.
45. Amanda C. Dolinski, Matthew C. Allender, Vincent Hsiao, **Carol W. Maddox**. A Systemic Chryso sporium Infection In A Free-Ranging Plains Garter Snake (*Thamnophis radix*). Poster presented at ACVP meeting, Seattle, WA, Dec. 2012J. Book Reviews (in print or accepted): None.
46. Elise Hall, Kara Lascola, Gabriela Calzada-Nova, Stephanie Freese, **Carol Maddox**. Equine Strangles: Evaluation in Weanlings of Two Novel Modified Live Vaccine Candidates Against *Streptococcus equi* ssp. *equi*. National Veterinary Scholars Symposium, Fort Collins, CO. Aug 2-5, 2012

Abstracts since promotion to professor with tenure at UIUC.

47. **Maddox, C.W.** Meeting Increasing Demands Upon Veterinary Diagnostic Microbiology Services Invited Speaker - A.L. Bortree Lecture Penn State University, Wed. Sept 11, 2013 University Park, PA.
48. **Maddox, C.W.** AAVLD Mini-Symposium on *Actinomyces* Friday October 18th, 2013 Town & Country Hotel, Pacific Salon 3 San Diego, CA
49. Ellis, K.L., Stevenson, A. K., Sweeney, I. Lanka, S. **Maddox, C.W.** Minimal Inhibitory Concentration Antimicrobial Susceptibilities of Coagulase Positive *Staphylococcus sp.* Associated with Canine Pyoderma (2011-2013) Sunday October 19, 2014 AAVLD Annual Conference Proceedings pg.96, Sheraton Crown Center, Kansas City, MO
50. Lindeblad, M., Lyubimov, A., Bartholomew, A. **Maddox, C.** Enrofloxacin as a population based intervention in H-ARS: mortality, infection and resistance rates.

Radiation Research Symposium – Non-human primates 2015

K. Other

1. **C.W. Maddox.** 2002. *Streptococcus equi* ssp. *equi* biotyping. Bacteriology Case Study Presentation. 45th Annual Meeting of the American Association of Veterinary Laboratory Diagnosticians. St. Louis, MO.
- §2. L. Borst and **C.W. Maddox.** 2003. A quantitative real time PCR assay for the detection of pathogenic *Leptospira spp.* in the urine of canine companions and wildlife. Poster for the Center for Zoonosis Research Conference. Urbana, IL.
3. A.S. Sreenivasan, G. Motelin, A. Pessier, G.A. Codd, Y.M. Nelson, **C.W. Maddox**, M.D. Anderson, L. Sileo, R. Kock, J.E. Cooper, J.C. Franson, W.W. Carmichael, M.E. Cooper, M.K. Kilewo, T.K. Mlengeya, T. Manyibe, M.O. Ruiz and V.R. Beasley. 2004. International Conference on Mass Die-offs of Lesser Flamingos (*Phoenicala minor*) in East and Southern Africa: Current Knowledge and Priorities for Research. College of Veterinary Medicine, University of Illinois, Urbana, IL.
4. J. Marrow, J. Whittington, L. Hoyer and **C.W. Maddox.** 2004. *Enterococcus spp.* prevalence and antibiotic resistance characteristics in wildlife predators pre- and post-antibiotic treatment. University of Illinois Program in Conservation, Wildlife Population Medicine and Ecosystem Health. Urbana, IL.
5. **C.W. Maddox.** 2004. Evaluation of the potential for recombination via genetic exchange between modified live *Streptococcus equi* ssp. *equi* vaccine and wild type strains. Annual Report to Fort Dodge Animal Health on a Technical Testing Agreement.
6. **C.W. Maddox.** 2005. Evaluation of the potential for recombination via genetic exchange between modified live *Streptococcus equi* ssp. *equi* vaccine and wild type strains. Annual Report to Fort Dodge Animal Health on a Technical Testing Agreement.
7. **C.W. Maddox.** 2006. Characterization of deletion mutant strains of *Streptococcus equi* ssp. *equi*. Research Progress Report to Fort Dodge Animal Health.
8. B.J. Smith and **C.W. Maddox.** 2006. Development of a web page on WebVads, the University of Illinois Veterinary Diagnostic Laboratory website, that enables veterinarians to access two to three years of antimicrobial susceptibility data generated at the University of Illinois Veterinary Diagnostic Laboratory and tabulate trends in susceptibilities of selected organisms, selected drugs, selected host organisms or combinations thereof. This minimal inhibitory concentration (MIC table) resource can enable users to make more informed choices for empirical treatment of bacterial infections. Both large and small animal data are accessible to veterinarians and College of Veterinary Medicine students through this Veterinary Diagnostic Laboratory website: <https://www-s.cvm.uiuc.edu/webvad/mic90/>.
9. N. Jung and **C. Maddox** contributed DNA sequences to National Center for Biotechnology Information for the *rfb* gene and upstream regions of the gene encoding LPS assembly for 5 serovars of *Leptospira*. [The sequences totaling over 25 Mb were assembled, aligned and annotated and were submitted to NCBI, March 12th, 2007.]
10. Invention Disclosure submitted to UIUC Office of Technology Management - April 2008 - Modified Live Multiple Deletion Vaccine for Equine Strangles.
11. Material Transfer Agreement with Pfizer Animal Health for a multiple antibiotic resistant isolate of *Mannheimia hemolytica* for use in screening new antimicrobials. March 2009.
12. Prepared instructional modules for the Threat Agent Detection and Response Program, Azerbaijan 2008 – 2009.
13. **C. Maddox.** 2011. “A Minute With” invited on-line publication of the UIUC on the recent O104:H4 Shiga-like toxin positive *E. coli* infection in Europe.
14. Burris, L.T., O’Dell, M.C., Lanka, S. Allender, M.C. and **Maddox, C.W.** 2014 Ophidiomyces ophidiicola 18S ribosomal RNA gene, partial sequence submitted to NCBI # 1689898

III. RESIDENT INSTRUCTION

A. Summary of Instruction (~ 25% effort)

Below are descriptions of courses in which Dr. Maddox participates at the University of Illinois at Urbana-Champaign

1. Descriptive Data

Courses in the UI CVM Professional Curriculum.

VM612/615 - PATH 669 - Veterinary Diagnostic Medicine (formerly VP 369)

Fall 2002 to present: Dr. Maddox, co-instructor, contributed four hours per block, 13 blocks per year of class contact time for PATH 669, the rotation for approximately 10 senior veterinary students per block. A two-hour laboratory was designed to review with the senior students some of the newer molecular technologies available at the Veterinary Diagnostic Laboratory. This is presented in a case review format with 11 or 12 cases from several host species. The third hour lecture presents information on antimicrobial susceptibility testing, interpretation of minimal inhibitory concentration testing results and a fourth hour is spent on case reviews emphasizing empirical drugs choices and treatment outcome.

VM 607 Veterinary Bacteriology and Mycology (formerly PATH 631, formerly VP 331)

Spring 2002 to present: Dr. Maddox presented lectures in VM607, taught to second year veterinary students. Three lectures emphasize the virulence of Enterobacteriaceae, especially *Escherichia coli* and *Salmonella enterica*. A lecture/demonstration on specimen collection and transport was converted to a lab independent study. Dr. Maddox now teaches 2 lectures on Staphylococci and one each on Streptococci, Lawsonia/Campylobacter, Francisella/Yersinia, Bordetella, and Mycoplasma. Finally, a lecture on minimal inhibition concentrations and antimicrobial susceptibility testing was incorporated, (formerly part of VB 619 -Veterinary Pharmacology). In 2015 a lecture on urinary tract infections was added. Dr. Maddox serves as a resource for the students during their case studies, using actual diagnostic reports and additional information from local veterinarians who participate. In 2014 Dr. Maddox became faculty coordinator for the course.

VM 601 & VM 606 – 1st and 2nd year Diagnostic Rotation

Fall 2009 to present: Dr. Maddox team taught 8 weeks each year with 6-8 students per week in a “hands-on” introduction of the first year (VM601) and second year (VM606) veterinary students to infectious diseases. Dr. Maddox developed a diagnostic microbiology module. In addition to lectures on proper specimen collection and transport, the students receive “hands-on” training on aseptic technique and use of a biosafety cabinet. Students perform Gram stains, learn basic microscopy skills, plate specimens and streak for isolation. Student also perform a case study, with faculty responsible for guiding students through developing differential diagnoses, selecting tests, evaluating results, arriving at a final diagnosis and recommendation for treatment. Dr. Maddox taught 4 weeks of VM601 and 4 weeks of VM606 with 8 students per weekly rotation. Actual contact time was about 3 hours each week plus 2 weeks with an additional 4 hours for the 2 clinical case studies that she led.

Courses in the Graduate Curriculum.

PATH 660 - Biology of Emerging Infectious Diseases (formerly VP 360)

Fall 2001, 2003 and 2005: Dr. Maddox contributed three one-hour lectures in this graduate class also open to senior level undergraduates and professional students as an elective. The content included global emerging diseases and was coordinated by Dr. G. Scherba. This course discussed the diverse mechanisms, which enable bacterial, viral and parasitic diseases to emerge or re-emerge in various populations

throughout the world. The material contributed by Dr. Maddox includes enteric pathogens, food borne illnesses and other zoonotic bacterial agents. The class has not been offered since 2005.

VM617 – Professional Development

During 2013 and 2014 I served as the faculty mentor for two 4th year DVM students each year during their professional development experiences. In 2105 I have one student doing research in my lab as part of her PD internship and another on externship.

2. Supervision of Graduate Student Research

Prior to her appointment at UIUC, Dr. Maddox was the major advisor for 3 students, who were awarded a PhD. (Kasemsuksakul, Fischer, and Zhang).

Since appointment at UIUC.

Major Advisor for PhD Student:

Luke Borst, D.V.M. DACVP, Department of Pathobiology, UIUC. 2004- May 2009. Dissertation title: Investigations into a rationally designed modified live vaccine for equine strangles.

(Currently Assistant Professor of Pathology, North Carolina State University, Raleigh, NC)

Jennifer Nickolyn-Martin, B.S., Department of Pathobiology, UIUC, Aug. 2015 - Present

-

Ph.D. Committee Member:

Sangeeta Rao, Department of Pathobiology, UIUC. May 2008.

Victor Perez, Department of Animal Sciences, UIUC. May 2011.

Minho Song, Department of Animal Sciences, UIUC. May 2011.

Yanhong Lui, Department of Animal Sciences, UIUC. 2009-2012

Dominic Santoro, Department of Veterinary Clinical Medicine, UIUC. 2010- 2013

Juliana Soares, Department of Animal Sciences, UIUC. 2010 – 2013

Rommel Tan, Department of Pathobiology, UIUC 2011 – 2013

Dan Woodburn, Department of Pathobiology, UIUC, 2013 – present

Jingjun Lin, Department of Pathobiology, UIUC, 2014 - present

M.S. Committee Member:

Courtney Ahern, Department of Veterinary Clinical Medicine, UIUC. December 2002.

Cara Cooke, Department of Pathobiology, UIUC. May 2002.

Tulsi Penmetchsa, Department of Pathobiology, UIUC. May 2005.

John Angus, Department of Veterinary Clinical Medicine, UIUC. May 2005.

Daniele Nucera, Department of Pathobiology, UIUC. December 2005.

Terry Miller, Department of Veterinary Clinical Medicine, UIUC. December 2005.

Sonali Desouza, Department of Pathobiology, UIUC. Withdrew in May 2006.

Elizabeth Estoff, Department of Pathobiology, UIUC. May 2008.

Christine Klements, Department of Veterinary Clinical Medicine, UIUC. May 2011.

Catherine Metry, Veterinary Clinical Medicine, UIUC. May 2011.

Sallianne Schlacks, Department of Veterinary Clinical Medicine, UIUC. 2011- 2012 Incomplete

Jamie Jeffreys, Pathobiology, UIUC May 2013

Ashley DeFransisco, Department of Pathobiology, UIUC Dec. 2013

Nadia Maradiaga, Veterinary Clinical Medicine Department, UIUC Oct. 2014 - present

Miranda O'Dell, Natural Resources and Environmental Sciences, UIUC, August 2015- present

3. Post-doctoral Trainees

Dr. Sheila Patterson, PhD – *E. coli* antimicrobial resistance genes and *Streptococcus equi* subsp. *equi* genetics of virulence factors and their regulation

Dr. Sara Lanka, PhD – Streptococcus and salmonella typing by pulsed field gel electrophoresis, Methicillin Resistant Staphylococci virulence genes

4. Other Contributions to Instructional Programs

Veterinary Medical Scholar - College of Veterinary Medicine, UIUC.

Luke Borst (2nd year veterinary student, UIUC) Center for Zoonoses Research Program.

Development of a qPCR assay for Leptospirosis detection. 2003.

Summer Interns Mentored - University of Illinois NIH sponsored Program (T35)

Stacy Furgang, (2nd year veterinary student, UIUC) Center for Zoonoses Research Program, UIUC: Colibacillosis in neonatal calves. (Drs. P. Constable and C. Maddox - project co-advisors). 2003.

Judilee Marrow (2nd year veterinary student). Program in Conservation, Wildlife Population Medicine and Ecosystem Health, UIUC: Antimicrobial resistance monitored in wild raptors. (Drs. J. Whittington, L. Hoyer and C. Maddox - project co-advisors). 2004.

Jackie Scapa (Undergraduate in Molecular and Cell Biology, UIUC). Center for Zoonoses Research Program, UIUC: Champaign county retention ponds: Potential risk factor for leptospirosis in canines. (Dr. M. Ruiz and C. Maddox - project co-advisors). 2006 & 2007.

Lisa Lukas (2nd year veterinary student, UIUC). Summer Research Training in Infectious Diseases, UIUC: Evaluating *sodA* encoded resistance to macrophage phagocytosis of Streptococcus strains. (C.W. Maddox - project advisor). 2006 & 2007.

Valerie Eisenbart (2nd year veterinary student, UIUC). Summer Research Training in Infectious Diseases, UIUC: Epidemiology of serovar specific Leptospira exposure and infections. (C.W. Maddox, project advisor). 2008.

Kourtney Cone (2nd year veterinary student, UIUC). Morris Animal Foundation Veterinary Scholars Program, UIUC: Risk of leptospirosis in terrestrial wildlife: A measure of ecosystem health. (Drs. Nora Mateus-Pinilla and Carol Maddox Project Co-Advisors). 2009 & 2010

Zach Westrick (2nd year veterinary student, UIUC). Summer Training in Translational Biomedical Research, UIUC: Quantitative PCR for detection and typing of canine lymphomas. (Dr. K. Singh project co-advisor). 2011.

Elise M. Hall (2nd year veterinary student, UIUC) Summer Research Training Program. Equine strangles: Evaluation in weanlings of two novel modified live vaccine candidates against *Streptococcus equi*. Elise Hall, Gabriela Calzada-Nova, Kara Lascola, Stephanie Freese, and **Carol Maddox**. Presented at the National Veterinary Scholars Symposium, Colorado State University, Fort Collins, CO August 2012. (K. Lascola project co-advisor)

Kaitlin M. Young (2nd year veterinary student, Michigan State Un.) Summer Research Training Program, The effects of experimentally induced acute endotoxemia on pulmonary TNF- \pm and lung inflammation in healthy adult horses. Kaitlin M. Young, Kara M. Lascola, Gabriela Calzada-Nova, Pamela A. Wilkins, **Carol W. Maddox**. Presented at the National Veterinary Scholar Symposium, Colorado State University Fort Collins, CO, August 21012. (K. Lascola project co-advisor)

Mara Varvil, (1st yr. DVM student, UIUC) Summer Research Training Program M-protein expression by *covS* mutant strains of *Streptococcus equi* ssp. *equi* –Varvil, M. and **C.W. Maddox** Presented at the National Veterinary Scholar Symposium, 2013

Special Problems Research Project Advisor, UIUC.

Molita Birchen (3rd year veterinary student, UIUC). Optimizing PCR detection of *Mycoplasma bovis* in bulk tank milk. (Drs. C.W. Maddox and R. Wallace project co-advisors). Summer 2002.

Charles Deutsch, DVM (MSPH student, UIUC) Center for One Health Program: Investigation of antibiotic resistance in turtles and fish from Salt Creek and Busey Woods with varying exposure to outflow from a wastewater treatment plant. Summer 2011.

Ian Sweeney (3rd & 4th year DVM Student and MPH candidate, UIUC) Exchange of virulence and resistance genes of *Staphylococcus* sp. infecting canine companions. Center for One Health Illinois - Capstone Research Program.

Brittany Kleszynski (Undergraduate Honor's Thesis, UIUC) LPS stimulation of TNF-alpha and IL1-beta expression by cultured peripheral blood monocytes of standardbred horses. 2013-2015

Workshops.

Organized a Two-Day Joint Illinois State Survey System-Funded Workshop Sponsored by the University of Illinois College of Veterinary Medicine and Illinois State Water Survey. Bacterial Identification and Water Quality. Dr. D. Walker (Illinois State Water Survey) and Dr. C.W. Maddox (College of Veterinary Medicine) co-hosted the Workshop to encourage collaboration (25 attendees). 2002.

Instructor for 4-H Veterinary Summer Camp.

4-H Veterinary Summer Camp (25 high school juniors and seniors), UIUC. Some Veterinary Microbiology Basics – 40 minute lecture and two 40 minute laboratory exercises on canine pyoderma culture and feline urine culture. 2009-2015

Continuing Education Publications and Lay Press.

1. "Food security in a new era: Veterinary laboratory intercepts pathogens before they reach the food supply." 2002. by Chris Beuoy.
2. *Veterinary Report*, Vol. 29(1). Profile on Dr. Maddox. 2005. by Erica Rothmier.
3. "A bad year for *Leptospira*." *The Sentinel*. 2005. by M. Kim Labak.
4. "New PCR-based tick-borne disease detection panel." *Veterinary Diagnostic Laboratory Newsletter* Issue 25, June 2011.
5. "Leptospirosis affects any breed" Pet Column, *The News Gazette*. 2011. by Andrea Lin.
6. Methicillin Resistant *Staphylococci* "Pet Column" *The News Gazette* 2015 by Melissa Giese
7. Biotyper Speeds Diagnoses, *The News-Gazette* (July 9, 2015)
8. Biotyper Speeds Diagnoses, WAND-TV17, (July 10, 2105)

B. Evaluation of Instruction

1. Student ICES Course Evaluation Results - 2002 to present (rating range 1-5):
 Instructor GLOBAL ITEM 1: Rate the instructor's overall teaching effectiveness.
 Instructor GLOBAL ITEM 2: Rate the overall quality of this course.

Semester	Course No.	No. of Forms	Elective Mixed Required	Mean Item 1	Mean Item 2	Norm Group Item 1	Norm Group Item 2
Summer 2007	669	8	R	3.9	4.3	LO AVG	AVG
Fall 2007	669	9	R	4.1	4.0	AVG	AVG
SPNG2008	669	6	R	4.3	4.3	AVG	AVG
SPNG2008	669	5	R	4.0	4.0	LO AVG	LO AVG
SUMM2008	669	8	R	4.0	4.6	LOAVG	AVG
FALL2008	669	8	R	4.1	4.4	AVG	AVG
FALL2008	669	8	R	3.7	3.7	LOAVG	LO AVG
SPRING 2009	669	3	R	3.7	3.9	LOAVG	LO AVG
SPRING 2009	669	9	R	3.0	2.7	LOW	LOW
Summer 2009	669	9	R	3.9	3.9	LOAVG	LO AVG
Fall 2009	669	10	R	3.6	3.9	LO AVG	AVG
Fall 2009	669	9	R	3.4	3.3	LOAVG	LOW
Summer 2010	669	9	R	3.2	3.9	LOW	LO AVG
Summer 2010	669	7	R	3.7	3.9	LO AVG	LO AVG
Summer 2010	669	7	R	3.7	4.2	LO AVG	AVG
Summer 2010	669	10	R	3.7	4.2	LO AVG	AVG
Fall 2010	669	9	R	3.6	3.6	LO AVG	LO AVG
Fall 2010	669	10	R	3.7	3.9	LO AVG	LO AVG
Fall 2010	669	9	R	4.4	4.6	AVG	AVG
Fall 2010	669	10	R	2.7	3.3	LOW	LOW
Fall 2010	669	9	R	2.9	3.1	LOW	LOW
Spring 2011	669	12	R	2.4	2.5	LOW	LOW
Spring 2011	669	7	R	2.8	2.9	LOW	LOW
Spring 2011	669	10	R	3.6	4.1	LOW	AVG
Fall 2011	669	11	R	4.1	4.2	AVG	AVG
Fall 2011	669	9	R	4.2	4.0	AVG	AVG
Fall 21011	669	23	R	3.8	4.4	LO AVG	AVG
Fall 2011	669	12	R	3.9	4.1	LO AVG	AVG
Fall 2011	669	12	R	3.9	3.9	LO AVG	LO AVG

Course Number	Credit Hours	Number Enrolled	Session % Creditable* (F, Sp. or Su.)	ICES scores**		
				Item 1	Item 2	
VM607	16	119	Sp 2014	12	N/A	N/A
VM607	16	120	Sp 2013	10	N/A	N/A
VM607	16	121	Sp 2012	10	N/A	N/A
VM601	3	32	F 2014	7.5	N/A	N/A
VM601	3	32	F 2013	7.5	N/A	N/A
VM601	3	32	F 2012	7.5	N/A	N/A
VM606	3	32	F 2014	7.5	N/A	N/A
VM606	3	32	F 2013	7.5	N/A	N/A
VM606	3	32	F 2012	7.5	N/A	N/A

VM612	4	10	Sp2014	2.5	4.2	4.0
VM613	4		Sp 2014	2.5		
VM612	4	21	Su 2014	2.5	4.8	4.9
VM615	4		F 2014	2.5		
VM616	4	21	Sp 2014	2.5	3.7	3.7
P669	4	18	Sp 2013	2.5	4.4	4.5
P669	4	47	Su 2013	2.5	4.2	4.4
P669	4	23	F 2013	2.5	4.1	4.4
P669	4	18	F 2013	2.5	4.4	4.4
P669	4	18	F 2012	2.5	4.4	4.5
P669	4	19	Su 2012	2.5	3.9	4.2
P669	4	19	Su 2012	2.5	4.3	4.4
P669	4	9	Su 2012	2.5	4.8	4.8
P669	4	31	F 2012	2.5	4.1	4.4
P669	4	17	F 2012	2.5	4.4	4.4

2. Candidate's Teaching Activities Report and Self-Review

Summary of Teaching Activities.

My expertise as a clinical microbiologist, with strengths in microbial pathogenesis and extensive food safety training, have made me well suited to instruct veterinary students on the aspects of bacteriology that affect both animal health and zoonotic diseases, those infections that can also cause disease in humans. To make the best use of the small class atmosphere with 4th year veterinary students during their diagnostic rotation, (VM612-WM616), I redesigned the content to a more problem solving or case review type format. The classes provide these "soon to be" practitioners with vital skills they will need when dealing with infectious disease problems, such as collecting and submitting appropriate diagnostic specimens, interpreting the diagnostic microbiology results, making empirical drug choices, and formulating a plan for treatment and prevention. As a result of the clinical microbiology experience that I have gained over my 26+ years of leading diagnostic veterinary microbiology laboratories, I am able to present the veterinary students with numerous examples and cases with applicability to our class presentations and discussions. My teaching reviews often credit my breadth and depth of knowledge, which enables me to encourage the students to delve deeper into topics of particular interest to them. While this seems to be lost on the 2nd year students as they try to assimilate such a vast amount of material in such a short time, the integrated cases introduce the 2nd year students to skills they build upon in pathobiology. This year I have begun putting summary notes in addition to the power point slides to provide additional information that they should be familiar with or have as a resource, but is not required for examinations.

Statement of Teaching Philosophy.

Professional Students

My area of expertise is applied, clinical veterinary microbiology. A driving force in my approach to teaching is the desire to prepare the veterinary students for their professional career as diagnosticians; for them to assimilate knowledge from their didactic courses and put it to use for problem solving of clinical cases. As veterinarians, they will need to sort out what laboratory results may or may not be important to an animal's clinical presentation. The most effective method I have found to teach such problem solving skills is through case reviews and discussions. Also, DVM students will be entering a very "hands on" profession, which requires them to have expertise with a large diversity of animal species that have many different clinical presentations, yet with fewer opportunities to refer to specialists compared to their physician colleagues. For this reason, I continually update my lectures and lab materials, trying to manage the information

explosion in microbiology and molecular diagnostics and provide the students with advances that are applicable to the comparative medical base veterinarians must work from. Consequently, it is essential to sift through this enormous volume of literature and select materials most beneficial to the veterinarians of 2012 and beyond. An additional trend that enters into my teaching philosophy is that, in truth many graduates, while initially determined to become practicing veterinarians, will move into allied careers, often within a few years. Thus, it is important that they be presented with foundational information and be trained in conceptual reasoning skills that will serve them well should they redirect their efforts toward research, industry or teaching.

Graduate Students

Mentoring graduate students is an area in which I feel that I excel. I enjoy the “one-on-one” interactions with my graduate students and try to be easily accessible to them and often work side-by-side with them on their projects. I seldom have more than one graduate student at a time, which enables me to be more of a participant rather than just a manager of their research. The Ph.D. students that I have mentored have become very accomplished in their fields of pathology (Fisher, Zhang and Borst) and microbiology (Kasemsuksakul). Several students, for whom I had extensive input into their research projects and served as their committee member, have gone on to very successful careers in academia (Rao & Song, Landolfi) and industry (Perez). A number of residents from the Veterinary Clinical Medicine Department, Animals Science Department and others have sought my guidance on their Master’s Degree research involving bacterial or fungal pathogens. Many have little prior experience working at biosafety level-2 containment; some have very little practical laboratory experience in microbiology and must be taught basic skills before they can begin their projects. Several seek advice related to animal challenge studies, pathogen recovery and enumeration, or further characterization or identification of pathogens from interesting clinical cases. Still others lack training in molecular methods such as PCR and sequence analysis. Thus, I have facilitated their manuscript publication in a veterinary specialty journal (a residency requirement) as well as several research publications. I am looking forward to having a new graduate student, Jennifer Nickolyn-Martin as part of a larger research group, collaborating with Dr. Marilyn O’Hare and others on the proposed ISEE grant with Leptospirosis as a model water-borne disease.

IV. SERVICE (PUBLIC, PROFESSIONAL/DISCIPLINARY AND UNIVERSITY)

A. Summary of Service: 49% Veterinary Diagnostic Laboratory, Institutional Biosafety Committee Chair (Now service in excess)

My efforts as Head of the University of Illinois Veterinary Diagnostic Laboratory (VDL) Microbiology Section contribute significantly to animal health, welfare, and agriculture animal productivity throughout the State and often nationally. My section responds to veterinarians regarding the diagnosis and treatment of individual companion animals, wildlife and livestock; the detection and monitoring of infectious agents capable of food-borne illness; and the detection of other zoonotic agents as well as threats to national animal health from foreign animal diseases. The VDL is nationally accredited by the American Association of Veterinary Laboratory Diagnosticians, the only accredited lab in Illinois.

Another aspect of my service responsibilities is as co-chair of the UIUC Institutional Biosafety Committee (IBC), a 22-member group, which reports to the Vice Chancellor for Research. This committee oversees all campus research involving recombinant DNA and/or the use of infectious agents and biohazards. In addition, the IBC works with the Division of Research Safety to insure campus compliance to National Institute of Health, United States Department of Agriculture, Environmental Protection Agency and other

federal and state regulations. We also cooperate with the Champaign County Public Health Department relative to biohazards that could impact community health.

1. Public Service

Veterinary Diagnostic Laboratory (VDL).

As Head of the Microbiology Section of the UIUC VDL, my responsibilities vary from monitoring the progress of each diagnostic case within my section to assay development to long range planning for facilities and staff in order to best serve Illinois veterinarians, companion animal health and the State's food animal industry. A successful clinical microbiology lab relies heavily on the training and experience of the bench microbiologists. It takes years for technicians to develop the knowledge of differential diagnoses and skills required for pathogen isolation and identification. It is a constant challenge to keep abreast of newly recognized or renamed organisms plus newly discovered virulence mechanisms. Much of my time is spent consulting with the College's Veterinary Teaching Hospital clinicians or referring veterinarians regarding optimal diagnostic testing approaches, interpretation of test results and treatment options. The results from my lab section may impact the health of a single pet, the disease status of an entire herd of cattle or swine, or the import/export status for an animal industry. I am case coordinator for approximately 4,200 accessions each year, with over 8,000 specimens cultured and more than 3,000 antibiotic susceptibility panels performed. Our testing also supports the pathologist's biopsies and necropsy investigations.

Over the years, both the Microbiology and Virology Sections have expanded their molecular diagnostic skills, relying more heavily upon cutting edge PCR such as quantitative PCR (qPCR) for pathogen detection, and the use of ribosomal RNA (rRNA) gene sequencing for identification of disease agents. The two services have shared resources to optimize our equipment, dedicated laboratory space, and highly trained staff, including two postdoctoral fellows, who assist us with design, validation and implementation of new assays. This has required additional development and modification of standard operating procedures and QA/QC documentation and reporting software. Several diagnostic assays have directly evolved from my research. For example, my laboratory is the sole referral center in the United States for the characterization of *Streptococcus equi*, a bacterium that causes the highly contagious upper respiratory tract infection of horses, called "strangles." In addition, we have adapted a qPCR to detect *Leptospira* in canine urine, enabling early detection of this zoonotic disease weeks before more routine methods. Prompt treatment of this infection is essential to prevent irreversible kidney and liver damage. Furthermore, our use of rRNA sequencing has resulted in our ability to identify pathogenic bacteria and fungi that we would be unable to speciate using standard biochemical tests and morphological criteria.

We have increased the scope of our services and now provide microbiology services for the Brookfield and Lincoln Park Zoos in Illinois, and Spa Wars Marine Mammal Institute in San Diego, CA. We also provide microbiology services for the UIC Medical School Primate Colony. In addition, through the VDL we have conducted collaborative research on clinical cases with Pet-Smart, Griffin Industries, UIUC Department of Animal Sciences, the Department of Veterinary Clinical Medicine and the University of Illinois Medical School. These cases are more complex, requiring my direct involvement and literature searches. Although quite time consuming, these projects are intellectually rewarding with potential for scholarly contributions to the scientific literature.

In recognition of my efforts in diagnostic microbiology, in September 2007 I received the Drs. Gordon and Mrs. Helen Kruger Service Excellence Award for outstanding service at the College of Veterinary Medicine, UIUC.

2. Service to Disciplinary and Professional Societies or Associations

National Committee Service.

Co-Chair, Bacteriology/ Mycology Sub-Committee, American Association of Veterinary Laboratory Diagnosticians. 1998-2001* and 2006-2009.

Co-Chair, Bacteriology Steering Committee, American Association of Veterinary Laboratory Diagnosticians. 2001-2004, and 2010 - present

Advisor, Subcommittee on Veterinary Antimicrobial Susceptibility Testing, Clinical Laboratory Standards Institute (formerly National Committee on Clinical Laboratory Standards). 2002-present.

Member, National Advisory Committee on Microbial Criteria for Foods, Food Safety and Inspection Service, United States Department of Agriculture. 2000-2004**

* Instituted quality assurance/quality control check test for U.S. bacteriology diagnostic laboratories.

** The subcommittee was charged by the FDA and USDA to redefine "Pasteurization" to include appropriate alternatives to classical thermal treatments consistent with advancing food safety needs and new methodologies. The subcommittee assigned this task worked for several years, its work culminating in the guidelines published. (NACMACF - Subcommittee on Redefining Pasteurization, May 2006 Requisite Scientific Parameters for Establishing the Equivalence of Alternative Methods for Pasteurization. *Journal of Food Protection* 69(5):1190-1216.)

Federal Grant Review.

The National Pork Producers Council, 1998-2005.

Ad hoc USDA NRICGP - Sections 32 (Food Safety) and 44 (Animal Protection), 1990-present.

NIH/NIAIC Special Emphasis Panel Reviewer, "Food and Waterborne Disease Integrated Research Network," February 2003.

USDA-NRI Panelist for Section 44 (Animal Protection), 2004-2006.

Ad hoc reviewer for USDA-Small Business Innovation Research Proposal, 2006.

Regional Grant Review.

North Central Regional U.S. Geological Survey Proposals, May 1998.

Kentucky Science and Engineering Research and Development Excellence Award, 2011

The Wellcome Trust/ DBT India Alliance Fellowship Application – 2014

Ad hoc Manuscript Review.

The Cornell Veterinarian

Journal of the American Veterinary Medical Association

Journal of Clinical Microbiology

Turkish Journal of Veterinary and Animal Science

Journal of Dairy Science

Journal of Veterinary Diagnostic Investigations

Molecular and Cellular Probes

International Journal of Medical Microbiology

Zoonosis and Public Health

Veterinary Microbiology

Foodborne Pathogens and Disease

Veterinary Pathology

Equine Veterinary Journal

Veterinary Microbiology

Professional Memberships.

American Society for Microbiology, 1989-present.
 American Association for Veterinary Laboratory Diagnosticians, 1989-present.
 NC-62, North Central Regional Committee on Enteric Disease, 1990-1993.
 United States Animal Health Association, 1995-2000.
 Comparative Gastroenterology Society.
 American Association of Food Hygiene Veterinarians, 2001-2006.
 Illinois State Veterinary Medical Association, 2004.
 Eastern Illinois Veterinary Medical Association, 2010- 2011.

3. University/Campus Service*Campus.*

Member, Biocontainment Facilities Committee, 2002.
 Member, Institutional Biosafety Committee, 2001-present
 Co-Chair, Institutional Biosafety Committee, 2002-present*
 Member, Center for Zoonoses Research, 2003-2006.
 Member, Responsible Conduct of Research Committee (OVCR), representing IBC, 2010-present.

* The Institutional Biosafety Committee (IBC) serves the entire UIUC campus; is charged with the review of all registrations for research, teaching or service that involve the use of biohazards and recombinant DNA. This includes studies on plant and animal pathogens, biotoxins, materials of human origin, as well as transgenic materials. As co-chair, I preside over the 22-member committee that evaluates all biosafety level 2 and higher classified projects. We work closely with the Division of Research Safety Biological Safety staff to insure that the recommended safety measures are practiced by all UIUC investigators, their staff and students so that the UIUC campus remains in compliance with federal, state and local requirements. I spend considerable time and effort as co-chair of the IBC for which I receive a one-month salary appointment. The committee completely reviews an average of 5 projects each month in addition to partial review and approval of approximately 6 or 7 projects screened by the Biological Safety staff. There are over 400 active project registrations on campus and I must address all compliance issues. As IBC co-chair, I also sit on the Research Compliance Committee for the UIUC Associate Vice Chancellor for Research Compliance and the Vice Chancellor of Research.

College of Veterinary Medicine.

Biotechnology Committee, 2000-2002.
 Pathobiology Department Head Search Committee, 2001-2002.
 Veterinary Teaching Hospital Infections Committee, 2001- present.
 Veterinary Teaching Hospital Director Search Committee, 2005.
 College Safety Committee, 2006- present.
 Chair, Veterinary Clinical Medicine Department Head 5 yr. Review Committee, Spring2011.
 College of Veterinary Medicine Admissions Interview Team for the Class of 2015 – 2019
 Milestone Examination Committee 2013-present
 OSCE Examination Team 2011 – present
 Courses and Curriculum Committee – 2014-present
 Vet. Med. Research Farm Committee - 2015

Department of Pathobiology.

Tenure-track Anatomical Pathologists Search Committee, 2009-2010.
 Capricious Grading Committee, 2011-2012.
 Faculty Grievance Committee, 2009-2012.
 Graduate Grievance Committee, 2011-2012.

Search Committee for two Anatomical Pathologist positions, 2010.

Veterinary Diagnostic Laboratory.

Veterinary Diagnostic Laboratory Safety Committee, 2000-2012

Chair, Search Committee for the Clinical Anatomical Pathologist, 2009-2010.

Search Committee for Clinical Pathologist position – 2014/2015

V. RESEARCH

A. Candidate's Statement of Research Goals and Accomplishments (~24% effort)

My interest in the virulence mechanisms of infectious agents has resulted in my involvement with many different bacterial pathogens, starting with my doctoral research that examined the regulation of expression of the *E. coli* adherence fimbria K88ab (F4), this characteristic being the key factor in making *E. coli* the leading agent contributing to enterotoxigenic neonatal diarrhea of swine. My expertise in characterization of *E. coli* virulence factors (such as fimbriae) ranged from cytotoxin assays using cell culture, ligated gut loops in infant mice, Ussing chambers, multiple antibody assays, and DNA hybridization and sequencing. Mentored in this work by Dr. Richard A. Wilson at the *E. coli* Reference Center at Penn State University and also performing related research under the direction of Dr. Bruce McClane on *Clostridium perfringens* toxins, my research efforts early on were focused on gastroenteric pathogens of livestock species. These experiences, coupled with a strong clinical microbiology background, led directly after my PhD program to a joint appointment at the University of Missouri in the Veterinary Microbiology Department and Veterinary Medical Diagnostic Laboratory. My research efforts there focused on salmonellosis, a significant bacterial problem for the swine industry. During this time, my PhD student, Kesera Kasumsuksakul, characterized an essential gene (*invH*) of *Salmonella cholera-suis* required for invasive infection (*Mechanisms in the Pathogenesis of Enteric Diseases*. 1997. 412:341-348). I nevertheless retained my fervent interest in *E. coli* attachment and my other PhD student, John Fischer, established that attaching-effacing *E. coli* possessing the protein intimin, which can cause enteric infection and diarrhea in the absence of shiga-like toxins typically associated with diarrhea (*American Journal of Veterinary Research*. 1994. 55(7):991-999). This finding has since been confirmed in humans.

In my subsequent position at Penn State University, the Pennsylvania agricultural community drove much of the state funding for research, enabling me to perform more applied research in my chosen area of gastroenteric bacterial diseases, studying acute bloody diarrhea of dairy cattle associated with *Clostridium perfringens*, enterohemorrhagic *E. coli* and Salmonella. (*Journal Clinical Microbiology*. 2005. 43(8):4208-4211). During this time, the scope of my research expanded to accommodate needed research in avian influenza transmission and the control of *Salmonella enteritis* infections in laying hens (*Journal Medical Entomology*. 1999. 36(6):888-891). I also was actively involved in mastitis research, identifying and studying a bacterial enzyme of Staphylococci that causes intramammary inflammation (*Infection and Immunity*. 2000. 68(3):1102-1108). A manuscript that resulted from my work with the *E. coli* Reference Center was a comprehensive review of veterinary colibacillosis that became widely cited (*Animal Health Research Reviews*. 2001. 1(2):129-140).

From 2000-2003, I was on a "Q" appointment at UIUC with 80% to 100% of my effort directed toward diagnostic service in order to establish molecular microbiology capabilities in the Veterinary Diagnostic Laboratory (funded largely through a C-FAR grant to Drs. G. Scherba, J. Andrews and C.W. Maddox). In Fall 2003, my appointment in the Department of Pathobiology increased to 51%, thereby enabling me to obtain graduate faculty status and devote more time to research. I completed a USDA subcontract with Dr. R. Singer examining antimicrobial resistance among gastroenteric flora of cattle (*Antimicrobial Agents and Chemotherapy*. 2004. 48(10):4047-4049). In 2005, Luke Borst began his Ph.D. studies in my lab while continuing his DVM course work as a UI Veterinary Medical Scholar. His interest in infectious disease

pathology and microbiology resulted in a good fit as we pursued many new molecular and microbiology techniques. These included his summer research project on canine leptospirosis, which led to an improved urine qPCR assay for detection of this pathogen in dogs. This assay is now routinely performed at the UI-VDL for which we receive specimens from throughout the U.S. A veterinary medical research fund grant on *Leptospira* detection, in collaboration with Dr. Myung Kim, led to production of serovar-specific monoclonal antibodies (Mab), which greatly improved an assay that utilizes Mab laser detection. A 2005 Spangler Companion Animal Grant enabled us to sequence several of the *Leptospira rfb* genes responsible for the biosynthesis of lipopolysaccharide, the surface antigen imparting leptospiral serovar specificity. Recently, we have collaborated with Dr. Mateus, IL Natural History Survey, to examine the prevalence of *Leptospira* in small mammals/wildlife, the most common reservoir for this infectious and zoonotic agent.

Our considerable UI-VDL banks of *Clostridium perfringens* isolates from livestock has enabled me to continue my long-term focus on enteric clostridial diseases and has led to collaborations with microbial geneticist Dr. Alexander Rooney (USDA) as we investigated correlations between toxin types and multi-locus sequence types (*Genetics*. 2006. 172:2081-2092). Collaborations with Dr. Ron Weigel and his graduate students enabled me also to continue my work with *Salmonella* and led us to examine methods to study the epidemiology of *Salmonella* transmission (*Journal of Clinical Microbiology*. 2006. 44:3388-3390 and 2007. 46:916-920).

In 2005, my research significantly expanded when I was asked to investigate a number of cases where vaccinated horses developed clinical strangles, an upper respiratory tract and lymph node infection caused by the bacteria *Streptococcus equi*. During the subsequent 7 years, my research emphasis has been on improving the safety and efficacy of Pinnacle®, a commercially available modified live strangles vaccine manufactured by Fort Dodge Animal Health. As many as 25% of Pinnacle®-vaccinated weanling horses and ponies developed abscesses below their jaw, typical of strangles. Since 2006, we have examined over 600 isolates of *S. equi* recovered from such clinical cases and determined that several changes in virulence gene DNA sequences resulted in reversion of the attenuated vaccine to a virulent state. Dr. Sara Lanka (research associate in my lab) has examined typing schemes for *S. equi* enabling us to differentiate between wild type and vaccine isolates (*Journal of Veterinary Diagnostic Investigation*. 2010. 22(6):928-936).

In order to examine the role of 13 virulence genes in the pathogenesis of *S. equi*, we developed a zebrafish survival assay to study the effect of 5 discrete gene deletions (prepared by Dr. Sheila Patterson, a research specialist in my lab). Dr. Luke Borst, for his dissertation research, studied the pathogenesis of the bacterial infection in zebrafish, mice, and guinea pig models as well as horses, the natural host (*American Journal of Veterinary Research* 72:1130-1138 and *Veterinary Pathology* Epub PMD 2199756A). More recently, we have utilized comparative genome hybridization methodology to locate *S. equi* strain gene differences as small as one base pair of DNA. A key result of this work was the identification of an alteration in a gene (*covS/R*) that controls the expression of several *S. equi* virulence traits. Dr. Sheila Patterson developed a *covS* deletion mutant strain and a RNA detection qPCR assay to study the expression of several virulence genes (hemolysin, capsule, 4 super antigens) under control of the *covS/R* system. A *covS* deletion mutant strain of *S. equi* that she constructed has great potential as an effective and safer modified live vaccine to prevent strangles in horses. This could have global impact as there are great risks to horses transported overseas for breeding, racing, shows and sales when vaccination is a risk as well as natural infections. Recombinant vaccine safety and efficacy studies are in progress and an invention disclosure is in preparation. This work is also being prepared for publication.

In keeping with my original focus on *E. coli* diarrheal disease, I established a collaboration with Drs. Victor Perez and James Pettigrew. Under my supervision, Dr. Sara Lanka developed a qPCR to enumerate the adherent bacteria from mucosal scrapings of the small intestine and colon of pigs challenged with specific pathogenic *E. coli*. We also applied an enterocyte detection probe, based upon the villin gene, which permitted expression of the results as bacteria per intestinal cell. While traditionally performed by tedious

microscopic methods, the new qPCR method is far more precise, rapid and efficient, allowing more statistical power to compare colonization levels by pathogenic versus commensal (normally harmless) bacteria. This technique promises to be an incredible aid to future enteric studies.

I believe that I am able to attain many of my desired career goals now that I have a majority appointment in the Department of Pathobiology with both research and graduate faculty privileges. The interaction with clinicians and referring veterinarians demands close attention to a breadth of literature and endless opportunities to collaborate and solve applied problems in the food animal, wildlife and companion animal arenas. The diagnostic service fuels my applied research efforts as I become aware of emerging diseases, local outbreaks, as well as individual animal health issues that could benefit from improved detection and characterization of infectious agents. Consequently, I have been asked to serve on several Department of Veterinary Clinical Medicine graduate committees of residents who seek to work with infectious diseases. This has resulted in 4 case reports (publications #24, 25, 26, & 30), a research paper in *Veterinary Dermatology* (#29) and one in *American J. of Veterinary Research* (#32). All of these have represented unique challenges that required adapting molecular microbiology techniques. Two projects (*Streptococcus* virulence and *Leptospira* zoonosis) have occupied the majority of my efforts, yet my expertise in food safety and gastroenteric pathogens has resulted in several small grants and/or technical testing agreements.