

Department of Veterinary Science and Microbiology
Departmental Report (CY2004)
July 1, 2005

Peer Reviewed Journal Articles

Lee, M.K., Billington, S.J., and Joens, L.A. 2004. Potential virulence and antimicrobial susceptibility of *Campylobacter jejuni* isolates from food and companion animals. *Foodborne Path. Dis.* 1:222-229.

van Meeteren, L.A., Frederiks, F, Giepmans, B.N.G., Fernandes Pedrosa, M.F., Billington, S.J., Jost, B.H., Tambourgi, D.V. and Moolenaar, W.H. 2004. Spider and bacterial sphingomyelinases D target cellular LPA receptors by hydrolyzing lysophosphatidylcholine. *J. Biol. Chem.* 279: 10833-10836.

Jost, B. H., Trinh, H. T., Songer, J. G. and Billington, S. J. 2004. Identification of a second tylosin resistance determinant, Erm B, in *Arcanobacterium pyogenes*. *Antimicrob. Agents Chemother.* 48: 721-727.

Jost, B. H., Trinh, H. T., Songer, J. G. and Billington, S. J. 2004. Ribosomal mutations in *Arcanobacterium pyogenes* confer a unique spectrum of macrolide resistance. *Antimicrob. Agents Chemother.* 48: 1021-1023.

Clarke IN, Cutcliffe LT, Everson JS, Garner SA, Lambden PR, Pead PJ, Pickett MA, Brentlinger KL, Fane BA. *J Bacteriol.* 2004 Nov; 186(22):7571-4.

Garner SA, Everson JS, Lambden PR, Fane BA, Clarke IN. Isolation, molecular characterisation and genome sequence of a bacteriophage (Chp3) from *Chlamydophila pecorum*. *Virus Genes.* 2004 Mar; 28(2):207-14.

Morais MC, Fisher M, Kanamaru S, Przybyla L, Burgner J, Fane BA, Rossmann MG. Conformational switching by the scaffolding protein D directs the assembly of bacteriophage phiX174. *Mol Cell.* 2004 Sep 24; 15(6):991-7.

Novak, C. R., Fane, B. A. The functions of the N-terminus of the øX174 internal scaffolding protein, a protein encoded in an overlapping reading frame, in a two scaffolding pr. *J. Mol. Biol.* 2004 Jan 2; 335(1):383-90.

Hafenstein, S. L., Chen, M., Fane, B. A. Genetic and functional analyses of the øX174 DNA binding protein: the effects of substitutions for amino acid residues that spatially organize the two. *Virology.* 2004 Jan 5; 318(1):204-13.

Bernal RA, Hafenstein S, Esmeralda R, Fane BA, Rossmann MG. The phiX174 protein J mediates DNA packaging and viral attachment to host cells. *J Mol Biol.* 2004 Apr 9; 337(5):1109-22.

Lee, M.K., S.J. Billington, L.A. Joens. Potential Virulence and Antimicrobial Resistance in *Campylobacter jejuni* Isolates Obtained from Food and Companion Animals as Determined via In Vitro Cell Culture Assays. *Foodborne Path. Dis.* 1:223-230. 2004.

Jost, B.H., Trinh, H.T., Songer, J.G. and Billington, S.J. 2004. Ribosomal mutations in *Arcanobacterium pyogenes* confer a unique spectrum of macrolide resistance. *Antimicrobial Agents and Chemotherapy*, 48:1021-1023.

Jost, B.H., Trinh, H.T., Songer, J.G. and Billington, S.J. 2004. Erm B is a determinant of tylosin resistance in *Arcanobacterium pyogenes*. *Antimicrobial Agents and Chemotherapy*, 48:721-727.

Bradley-Dunlop, D.J., C. Pantoja, and D.V. Lightner. Development of Monoclonal Antibodies for the Detection of Necrotizing Hepatopancreatitis in Penaeid Shrimp. 2004. *Diseases of Aquatic Organisms* 60: 233-240.

Tang, K.F.J., J. Wang, and D.V. Lightner. Quantitation of Taura syndrome virus by Real-time RT-PCR with a Taqman assay. 2004. *Journal of Virological Methods* 115: 109-114.

Gong, H., D.H. Jiang, D.V. Lightner, C. Collins, and D. Brock. A dietary modification approach to improve the osmoregulatory capacity of *Litopenaeus vannamei* cultured in the Arizona desert. 2004. *Aquaculture Nutrition* 10: 227-236.

Pantoja, C.R., S.A. Navarro, J. Naranjo, D.V. Lightner, and C.P. Gerba. Non-susceptibility of three primate cell lines to infection by Taura Syndrome Virus of penaeid shrimp. 2004. *Emerging Infectious Diseases* 10(12): 2106- 2112.

Nunan, L.M., C.R. Pantoja, M. Salazar, F. Aranguren, and D.V. Lightner. Characterization and molecular methods for detection of a novel spiroplasma pathogenic to *Penaeus vannamei*. 2004. *Diseases of Aquatic Organisms* 62: 255-264.

Vanpatten K.A., L.M. Nunan, and D.V. Lightner. Seabirds as potential vectors of penaeid shrimp viruses and the development of a surrogate laboratory model utilizing domestic chickens. 2004. *Aquaculture* 241: 31-46.

Nunan, L.M., K. Tang-Nelson, and D.V. Lightner. Real-time RT-PCR determination of viral copy number in *Penaeus vannamei* experimentally infected with Taura Syndrome Virus (TSV). 2004. *Aquaculture* 229: 1-10.

Bradley-Dunlop DJ, Pantoja C, Lightner DV. 2004. Development of monoclonal antibodies for detection of necrotizing hepatopancreatitis in penaeid shrimp. *Diseases of Aquatic Organisms* 60:233-240.

Selmin O, Thorne PA, Blachere FM, Johnson PD, Romagnolo DF. 2004. Transcriptional activation of the membrane bound-Progesterone Receptor (mPR) by dioxin, in endocrine-responsive tissues. *Molecul. Repr. and Develop.* 29; 70(2): 166-174.

Songer J Glenn and DW Miskimins. 2004. *Clostridium perfringens* type E enteritis in calves: two cases and a brief review of the literature. *Anaerobe* 10: 239-242.

Post KW and J Glenn Songer. 2004. Antimicrobial susceptibility of *Clostridium difficile* isolated from neonatal pigs with enteritis. *Anaerobe* 10: 47-50.

Li DY, AO Scheimann, J Glenn Songer, RE Person, M Horwitz, L Resar, and KB Schwarz. 2004. Enteritis necroticans with recurrent enterocutaneous fistulae caused by *Clostridium perfringens* in a child with cyclic neutropenia. *J Pediatr Gastroenterol Nut* 38:213-215.

Checkley, W., R.H. Gilman, R.E. Black, L.D. Epstein, L. Cabrera, C.R. Sterling, and L.H.Moulton. Effect of water and sanitation on childhood health in a poor Peruvian peri-urban community. *Lancet* 363: 112-118, 2004.

Abstracts

J.E. Sprinkle, S. P. Cuneo, H. M. Fredrick, R. M. Enns, D. W. Schafer, G. E. Carstens, L. J. Slay, S. R. Daugherty, T. H. Noon, B. M. Rickert and C. Reggiardo. Effects of a long acting trace mineral rumen bolus upon range cow and calf trace mineral profiles. Proceedings, Western Section, American Society of Animal Science, Vol 54, 2004.

J. E. Sprinkle, S. P Cuneo, et al. Effects of a long acting trace mineral rumen bolus upon range cow productivity. Proceedings, Western Section, American Society of Animal Science, Vol 54, 2004.

Cooper, K.K., Keel, M.K., Stewart, B.A., Trinh, H.T., Jost, B.H. and Songer, J.G. 2004. Virulence for chickens of *Clostridium perfringens* isolated from poultry and other sources. Proceedings, 85th Conference of Research Workers in Animal Diseases, Chicago IL, USA.

Songer J.G., Keel, M.K., Anderson, M.A., Trinh, H.T., Post K.W., Yaeger, M.J. and Jost, B.H. 2004. The emergence of *Clostridium difficile*-associated disease (CDAD) in US swine production. Proceedings, 85th Conference of Research Workers in Animal Diseases, Chicago IL, USA.

Billington, S.J., Rudnick, S.T. and Jost B.H. 2004. Genetic regulation of the *Arcanobacterium pyogenes* toxin, pyolysin. Proceedings, 85th Conference of Research Workers in Animal Diseases, Chicago IL, USA.

Jost, B.H., Trinh H.T. and Songer J.G. 2004. Multi locus sequence typing of *Clostridium perfringens*. Proceedings, 85th Conference of Research Workers in Animal Diseases, Chicago IL, USA.

Selmin O, Thorne P, Runyan R. Effects of trichloroethylene and its metabolite trichloroacetic acid on the expression of vimentin in the rat H9c2 cell line. Superfund Basic Research Program and Southwest Environmental Health Sciences Center. Science Fair 2004, Tucson AZ. Poster Presentation.

Selmin O, Thorne P, Blachere F, Johnson P, Romagnolo D. Transcriptional activation of the membrane bound progesterone receptor (m-PR) by dioxin, in endocrine responsive tissues. Superfund Basic Research Program and Southwest Environmental Health Sciences Center. Science Fair 2004, Tucson, AZ.

Stringham, M.A., C.R. Sterling, R. Gilman, V. Cama, L. Cabrera and C. Taqueri. *Giardia intestinalis* in a Peruvian Shantytown. 79th Annual Mtg. American Society of Parasitologists #37, 2004.

Book/Book Chapter/Textbook

Jost, B.H. and Billington, S.J. 2004. *Corynebacterium* and *Arcanobacterium*. In: Pathogenesis of Bacterial Infections of Animals. Gyles, C.L., Prescott, J.F., Songer, J.G. and Thoen, C.O. (eds). 3rd Edition. Iowa State University Press, Ames, IA. pp. 77-84.

Joens, L.A.: "Campylobacter : Molecular and Cellular Biology" by M.E. Konkel. Chapter 22, pp. 415-420. Horizon Press. 2004.

Marchello, Elaine. 2004. Contributions to Society: Slaughter By-Products. Encyclopedia of Animal Science; Edited by Wilson G. Pond and Alan W. Bell; Marcel Dekker, Inc., New York, New York. pg 258-260.

Songer, Glenn. European Community Handbook on Clostridial Disease in Animals. Two chapters: Enteritis and enterotoxemia in cattle, Abomasitis.

CL Gyles, JF Prescott, J Glenn Songer, and CO Thoen (editors). Enteric clostridia. In: Pathogenesis of bacterial infections in animals. 2004. Ames, IA: ISU Press.

Songer JG and KW Post. 2004. Veterinary Microbiology: Bacterial and Fungal Agents of Animal Disease. St Louis: Elsevier.

CL Gyles, JF Prescott, J Glenn Songer, and CO Thoen (editors). Histotoxic clostridia. In: Pathogenesis of bacterial infections in animals. 2004. Ames, IA: ISU Press.

Gyles CL, JF Prescott, JG Songer, and CO Thoen, editors. Pathogenesis of Bacterial Infections in Animals. 2004. Ames, IA: ISU Press.

Sterling, C.R. and Y.R. Ortega. Cyclospora cayetanensis: An emerging and still perplexing coccidian parasite. In *The Pathogenic Enteric Protozoa: Giardia, Entamoeba, Cryptosporidium and Cyclospora*, C.R. Sterling and R.D. Adam (eds). Kluwer Academic Publishers, Boston. pp. 43-57. 2004.

Sterling, C.R. and R. Adam, editors. *The Pathogenic Enteric Protozoa: Giardia, Entamoeba, Cryptosporidium and Cyclospora*. Kluwer Academic Publishers, Norwell, MA, 169pp. 2004.

Extension Reports

Cuneo, S. Peder. Preventing West Nile Virus and More. *Arizona Land and People*. Vol 1, pg 4.

Cuneo, S. Peder. Selenium Deficiency In Arizona Range Cattle. *Arizona Veterinary Diagnostic Laboratory Newsletter*. Vol 9, Issue 3, page 2.

Cuneo, S. Peder. Animal Health Alert, Blister Beetle Toxin in Horses. *AzVDL web page*.

Cuneo, S. Peder. Flow Chart for Diagnosis of Livestock Toxicity. *AzVDL web page*.

Popular Press

Wyban, J., B. White, and D.V. Lightner. 2004. TSV challenges advance selective breeding in pacific white shrimp. *Global Aquaculture Advocate*. Vol.7(6): 40-41.

Tang, K., and D.V. Lightner. 2004. Geographic variation among IHHNV isolates provides insights into their pathology, spread. *Global Aquaculture Advocate*. Vol.7(1): 91-92.

Lightner, D.V., H. Gong, J. Wilkenfeld, and C. Collins. 2004. Syndromes associated with low salinity water in Arizona. *USMSFP Industry Briefs*. Vol. 10(4) 3 & 7.

Hennig, O., K. Keller, L. Rasmussen, S. Arce, S. Moss, B. White-Noble, D.V. Lightner, V. Breland, and J. Lotz. 2004. Strain of reference shrimp aids researchers, farmers. *Global Aquaculture Advocate*. Vol.7(6) 74.

Jiang, D.H., J.L. Rocha, D. Ciobanu, A. Mileham, H. Van der Steen, B. White-Noble, and D.V. Lightner. 2004. Quantitative, molecular genetic selection for shrimp disease resistance. *Global Aquaculture Advocate*. Vol. 7(1): 52-55.

Lightner, D.V., C.R. Pantoja, K.F.J Tang, R.M. Redman, T. Pasos-de-Andrade, and J.R. Bonami. 2004. Infectious myonecrosis: a new disease in Pacific white shrimp. *Global Aquaculture Advocate*. Vol.7(5): 85.

Kathy F.J. Tang and Donald V. Lighner. 2004. Geographic variation among isolates of infectious hypodermal and hematopoietic necrosis virus (IHHNV) provides insight into their pathology and spread. *Global Aquaculture Advocate*. Feb. pages 91-92.

Presentations

Stephen J. Billington

Pyolysin: the “hole” story of *Arcanobacterium pyogenes* infections. 43rd Arizona Nevada Branch American Society for Microbiology Annual Meeting, Tucson AZ, USA.

Pyolysin of *Arcanobacterium pyogenes*: Lord of the Rings or a pore vaccine. Pathobiology Seminar Series, Department of Veterinary Science and Microbiology, University of Arizona, Tucson AZ, USA.

Arcanobacterium pyogenes virulence factors: preparing for opportunity. Microbiology and Immunology Seminar Series, Department of Microbiology and Immunology, University of Arizona, Tucson AZ, USA.

Gregory Bradley

Leopard frog population trends associated with chytrid fungus disease (chytridiomycosis) in southern and central Arizona. Connecting Mountain Islands and Desert Seas: Biodiversity and Management of the Madrean Archipelago II and 5th Conference on Research and Resource Management in the Southwestern Deserts. May 11-15, 2004. Tucson, Arizona.

Diagnostic Veterinary Pathology. Presented a description of diagnostic veterinary pathology to the UA Pre-Vet Club.

The Arizona Veterinary Diagnostic Laboratory. Presented to various groups of UA, high school, vet tech and community college students along with a tour of the AZVDL.

Agricultural Bioterrorism Surveillance and the role of the AZVDL. Presented to the Ag 100 Council. Described the role and current activities of the AZVDL in foreign animal disease/agricultural bioterrorism surveillance in Arizona. Presented at Estrella Mountain Community College, on 10/8/2004.

S. Peder Cuneo

"Biosecurity for Arizona"; "Case Study for Biosecurity: Trich, 'A Thief in the Night': AgroTerrorism Risks to Native American Livestock. Presented at Agroterrorism Meeting, Hondah Conference Center, Hondah, Arizona on 9/28/2004.

Update on Arizona ALIRT Program, presentation to Arizona Cattlemen's Assn. Centennial Celebration. Presented at Prescott, AZ on 7/25/2004.

Arizona Beef Quality Assurance Workshop. Presented at ACA 2001 Convention, Pinetop, AZ on 7/26/2004.

Bio-Security: Protecting Arizona's Borders. Presented at V Bar V Ranch Explorers Field Day, Camp Verde, AZ on 8/28/2004.

Maintaining a Healthy Flock. The Future of Lamb Production in Arizona. USDA Risk Management, Coronado RCGE, U of AZ Southwest Strategy and Arizona AG Producers Network. Presented at Tucson, AZ on 9/29/2004.

Conception to Consumer Workshop: From the Ranch to Your Plate. Presented at Tucson, AZ on 3/17/2004.

Janet M. Decker

Presenter, Teaching Symposium. "Evolution of a Teacher: How I started focusing on what students are doing", Innovations in College Biology Teaching, University of Arizona, August 18, 2004.

Panel Discussion, Teaching Workshop. Presented at University of Arizona on 11/17/2004. Panel Discussion on "Cheating: Prevention, Deterrence and/or Repercussions" for PS 697A Physiological Sciences Teaching Workshop.

Sharon Dial

Continuing Education in Clinical Pathology for General Practitioners. ACVP/ASVCP Conference. Orlando, Florida. Nov 13-17, 2004.

Necrotizing protozoal dermatitis due to *Toxoplasma gondii*-like organisms in a Dog. Platform presentation. ACVP/ASVCP Conference. Orlando, Florida. Nov 13-17, 2004.

Dietary Celecoxib Enhances the Efficacy of Tumor Lysate-Pulsed Dendritic Cell Vaccines in Treating Murine Breast Cancer. Poster presentation. 19th annual meeting of the International Society for Biological Therapy of Cancer, San Francisco, CA. Nov. 5-7, 2004.

Lynn Joens

USDA NC-62 report. Annual report for the NC-62 technical committee, Nov. 7-8, 2004. St. Louis, MO.

B. Helen Jost

Arcanobacterium pyogenes adhesion: hanging on for dear life. Pathobiology Seminar Series, Department of Veterinary Science and Microbiology, University of Arizona.

Donald Lightner

Diseases of Concern to the Shrimp Culture Industry of Belize: Recent History and Potential Threats. International Intensive Shrimp Culture Symposium, Belize. November 3-5, 2004.

Activities of the Aquatic Animal Health Standards Commission and Some Shrimp Diseases of Concern to the Americas. 17th Conference of the OIE Regional Commission for the Americas, Panama City, Panama. November 16-19, 2004.

Infectious Myonecrosis (IMN): Current status report on the biology of the etiological agent and development of diagnostic methods. Feira Nacional de Camarao (FENACAM). Presented at Natal-RN, Brazil on 2/6/2004.

Biosecurity in Shrimp Farming: Pathogen Exclusion through use of SPF stock and Routine Disease Surveillance. Aquaculture 2004. Presented at Honolulu, Hawaii on 3/3/2004.

Infectious Myonecrosis (IMN): A New Virus Disease of Litopenaeus vannamei. Department of Veterinary Science and Microbiology, 2004 Spring Seminar Series.

Development of Monoclonal Antibodies for the Detection of Necrotizing Hepatopancreatitis in penaeid shrimp. Aquaculture 2004. March 1-4, 2004. Honolulu, Hawaii.

Different cellular responses to an infection by Hypodermal and Hematopoietic Necrosis Virus (IHHNV) in Penaeus monodon and Litopenaeus vannamei. Aquaculture 2004. March 1-4, 2004. Honolulu, Hawaii.

Production of a standard reference strain of shrimp for disease-related research. Aquaculture 2004. March 1-4, 2004. Honolulu, Hawaii.

Infectious Myonecrosis (IMN): A new virus disease of Litopenaeus vannamei. Aquaculture 2004. March 1-4, 2004. Honolulu, Hawaii.

Advances in Epidemiology and Biosecurity of Penaeid Shrimp Diseases. Aquaculture 2004. March 1-4, 2004. Honolulu, Hawaii.

Significant reduction in the replication rate of Taura Syndrome Virus (TSV) in *Litopenaeus vannamei* held in hyperthermic conditions. Aquaculture 2004. March 1-4, 2004. Honolulu, Hawaii.

Evolution of the USMSFPs Shrimp Breeding Program: A 10-year retrospective & prognosis for the Future. Aquaculture 2004. March 1-4, 2004. Honolulu, Hawaii.

Non-susceptibility of Three Mammalian Cell Lines to Infection by Taura Syndrome Virus of Penaeid Shrimp. Aquaculture 2004. March 1-4, 2004. Honolulu, Hawaii.

Characterization of a Novel Spiroplasma Pathogenic to *Litopenaeus vannamei* and Molecular Methods for the Detection of the Organism. Aquaculture 2004. March 1-4, 2004. Honolulu, Hawaii.

Genetic variation between isolates of Taura Syndrome virus from Different Geographical Regions. Aquaculture 2004. March 1-4, 2004. Honolulu, Hawaii.

Birds as a Mechanism of Viral Transmission of WSSV, TSV, YHV, and IHHNV: Infectivity studies in *Litopenaeus vannamei*. Aquaculture 2004. March 1-4, 2004. Honolulu, Hawaii.

Establishment of specific pathogen free (SPF) penaeid shrimp: evolving strategies for a dynamic process. Presented at Honolulu, Hawaii on 3/4/2004.

Carlos Reggiardo

Field research on trace mineral supplementation of cattle (V-V ranch). Effects of a long acting trace mineral rumen bolus upon range cow and calf trace mineral profiles. Presented at Corvallis, Oregon on 6/15/2004.

Improving Ruminant use of forages in Sustainable Production systems for the Western U.S. Western Coordinating Committee #110 Annual Report.

Michael W. Riggs

Parasite Ligand-Based Strategies for Immunization Against Cryptosporidiosis. Seminar presented March 19, 2004, University of Florida.

Findings on parasitocidal proteins and enzymes active against *Cryptosporidium*. ioGenetics LLC, Madison, WI on 9/9/2004.

Control of bovine cryptosporidiosis using antibody-based strategies to disrupt parasite ligand function and target delivery of parasitocidal agents. Keynote Speaker. Presented at Chicago, IL on 11/15/2004. Conference of Research Workers in Animal Disease.

Seminar on my sabbatical research, University of Florida, College of Veterinary Medicine, Pathobiology Seminar Series. May 11, 2005.

Cryptosporidiosis Research, Department of Biomedical Sciences, Oregon State University, College of Veterinary Medicine, College Speaker Series, May 16-18, 2005.

J. Glenn Songer

The emergence of *Clostridium difficile*-associated disease (CDAD) in US swine production. 84th Conf Res Workers An Dis, Keynote address.

Clostridium difficile remains a problem for swine producers and veterinary diagnosticians. Bacteriology Mycology Steering Committee, Proc 47th Ann Mtg Amer Assoc Vet Lab Diagn.

Things you'd already know about clostridial enteric disease, if you'd been paying attention. Enteric Disease Committee, Proc 47th Ann Mtg Amer Assoc Vet Lab Diagn.

A brief history of bio- and agro-terrorism. A Plan of Action: Biological Terrorism Preparedness for Veterinary Bacteriology Laboratories. Amer Assoc Vet Lab Diagn/Nat Laboratory Training Network. Greensboro, NC.

Clostridium novyi induction trial to evaluate the pathogenesis of clinical disease. Proc 18th Congr Int Pig Vet Soc.

Clostridium difficile-associated disease in neonatal swine: New findings. Proc 18th Congr Int Pig Vet Soc.

Clostridium perfringens in the gut of domestic animals: The best of microbial imperialism. Proc Anaerobe Soc Americas. Annapolis, MD.

Clostridial swine disease: The good, the bad, and the ugly. Proc Amer Assoc Swine Veterinarians, Session on Emerging Disease. Des Moines, IA.

Multi-locus sequence typing of *Clostridium perfringens*. 84th Conf Res Workers An Dis.

Genomics, genetics and pathogenesis of *Dichelobacter nodosus*. Proc Nat Workshop on Footrot.

Ulcerative enteritis associated with *Clostridium perfringens* type A in bobwhite quail (*Colinus virginianus*). Proc 47th Ann Mtg Amer Assoc Vet Lab Diagnosticians.

Clostridium difficile in domestic animals: The wolf at the door. First Internat Clostridium difficile Symp. Kranjska Gora, Slovenia.

Clostridial infections on days 1-3: Treatment frenzy or hope for prevention. Swine Health Symposium, Carthage Veterinary Services, Carthage, IL.

Enterotoxemia by enterotoxin and beta2 toxin positive Clostridium perfringens type D in a goat kid. Proc 47th Ann Mtg Amer Assoc Vet Lab Diagnosticians.

Specific effects of C. difficile toxins in pig intestinal mucosa. 43rd Ann Mtg Arizona/Southern Nevada Branch Amer Soc Microbiol.

Surviving in an unaccommodating environment: finding and keeping grants. USDA Western Conf on Grants and Funding. Tucson, AZ

Prevention of Clostridium difficile-associated disease in pigs by colonization with nontoxigenic C. difficile. 84th Conf Res Workers An Dis.

Charles Sterling

Parasites in Meats and Fresh Produce. Two seminars on Cryptosporidium, Giardia, Toxoplasma, the Microsporidia, Taenia, Trichinella and Sarcocystis in meats and fresh produce before consumer and various governmental groups on July 8-9, 2004 in Griffin, Georgia.

Los parasitos enterico y problemas de salud. Presented at Lima, Peru on 5/25/2004. Invited seminar to the Parasitology department at the Universidad Peruana Cayetano Heredia in Lima, Peru (in spanish).

Parasite Problems in Peru. Presented at Tucson, AZ on 3/24/2004. Invited talk to Internship program "Fostering and Achieving Cultural Equity and Sensitivity in the Health Professions."

Extension Presentations

S. Peder Cuneo

Foreign Animal Diseases. Presented at San Carlos, AZ on 4/20/2004. San Carlos Apache Tribe Homeland Security Livestock Surveillance.

Livestock Toxins in an Alfalfa Production System. Presented at Parker, AZ on 3/12/2004. 2004 Farmer's Day Workshop.

Breeding Soundness of Bulls. Presented at Dripping Springs, San Carlos Apache Reservation on 3/6/2004. Stocksperson of the Year, University of Arizona, San Carlos Cattle Associations.

Calving Management. Presented at Dripping Springs, San Carlos Apache Reservation on 3/6/2004. Educational Campaign Stocksperson of the Year, University of Arizona Cooperative Extension, Cattle Associations.

Security in our Livestock Herds. Presented at Laughlin, Nevada on 1/28/2004. Southwest Indian Agriculture Association 16th Annual Conference Program.

Range Livestock Nutrition for the Southwest. Invited Speaker, Series of three livestock workshops in Arizona.

Research In Progress

National Animal Health FAD Surveillance Network. Robert Glock with Colin Kaltenbach. 2002 \$750,000.00 (\$750,000.00 Total) (USDA/CREES).

Diseases of Cultured Penaeid Shrimp: Disease Prevention, Diagnosis and Treatment in Domestic Shrimp Culture. Donald Lightner. 1987 \$374,565.00 (\$5,652,980.00 Total) (Subcontract from the Oceanic Institute, USDA, CSREES Grant No. 2002-388-08-01345).

Animal Diagnostic Laboratory Network. Gregory Bradley with Colin Kaltenbach, Robert Glock. 2002 \$308,000.00 (\$1,013,000.00 Total) (USDA, CSREES).

Enteric pathogens in oysters. Lynn Joens with Jay Levine, Linda Saif, Chuck Gerba. 2001 \$225,000.00 (\$1,100,000.00 Total) (USDA-NRI Food Safety Epidemiology).

Control of Bacterial Disease in Penaeid Shrimp with Florfenicol: A Proposal to Schering-Plough Animal Health. Donald Lightner. 2004 \$220,000.00 (\$220,000.00 Total) (Schering-Plough Animal Health Corporation).

Role of Toxins A and B in Pathogenesis of Clostridium difficile-associated Disease in Pigs. Glenn Songer. 2003 \$194,319.00 (\$194,319.00 Total) (Novartis Animal Vaccines).

Prevalence of pathogenic Campylobacter in Poultry. Lynn Joens with Mike Konkel. 2002 \$175,000.00 (\$581,000.00 Total) (USDA-National Integrated Food Safety Initiative).

Antibody Biocide Fusions to Control Cryptosporidium. Michael W. Riggs with M. Imboden and R. Bremel. 2003 \$160,086.00 (\$929,938.00 Total) (NIH-NIAID).

Passive Immunity to Clostridium difficile Infection in Piglets. Glenn Songer. 2003 \$150,000.00 (\$330,000.00 Total) (Dow AgroSciences).

Identification of Differentially Expressed Genes in *Campylobacter* Virulence. Lynn Joens. 2002 \$139,997.00 (\$350,000.00 Total) (USDA-NRI Food Safety).

Molecular characterization of TCE and Arsenic as teratogens in embryonic development. Ornella Selmin. 2000 \$114,000.00 (\$580,000.00 Total) (NIH-EPA).

Molecular and Biochemical Characterization of the *Cryptosporidium* Glycoprotein Ligand CSL. Michael W. Riggs with Co-Investigators: B.H. Jost and M.R. McNeil. 2001 \$110,000.00 (\$300,000.00 Total) (U.S. Department of Agriculture NRI Competitive Grants Program).

Imaging Core (NIH Program Grant, Host Control in *Coccidioidomycosis*). Sharon Dial with Monika Schmelz, William Bellamy, Neil Ampel. 2004 \$105,032.00 (\$558,305.00 Total) (NIH).

Therapeutic monoclonal antibodies for human *Clostridium difficile*-associated disease. Glenn Songer. 2004 \$100,000.00 (\$100,000.00 Total) (NIH (with MAPP Pharmaceutical)).

Genome Sequencing of Sheep Pathogen *Dichelobacter nodosus*. Glenn Songer with I Paulsen, J Rood. 2001 \$100,000.00 (\$402,530.00 Total) (USDA CSREES/NSF).

Molecular and biochemical characterization of the *Cryptosporidium* glycoprotein ligand CSL. B. Helen Jost with Michael Riggs and Michael McNeil. 2000 \$100,000.00 (\$300,000.00 Total) (USDA).

Role of *Clostridium difficile* in Porcine Neonatal Enteritis. Glenn Songer. 2003 \$100,000.00 (\$300,000.00 Total) (USDA-NRI).

Characterization of genetic factors required for *Campylobacter* & *Salmonella* colonization: identifying potential target genes for pre-harvest intervent. Lynn Joens with Yung-Fu Chang, Michael Konkel, Bryan White, Qijing Zhang. 2005 \$100,000.00 (\$5,000,000.00 Total) (FSRRN FS Cap).

Histologic Markers of Resistance to *Coccidioidomycosis*. Sharon Dial with John Galgiani, Lisa Shubitz. 2004 \$97,083.00 (\$677,549.00 Total) (NIH).

Role of *Clostridium difficile* and *C. perfringens* in Neonatal Enteritis of Pigs. Glenn Songer. 2003 \$86,280.00 (\$86,280.00 Total) (Pfizer).

Specific-pathogen-free (SPF) marine shrimp culture on Guam. Donald Lightner with K.F.J. Tang-Nelson and S. Nelson. 2003 \$80,135.00 (\$80,135.00 Total) (National Marine Fisheries Service, Grant No. NA03NMF4270131).

West Nile Virus Surveillance. Gregory Bradley with Robert Glock, Carlos Reggiardo, Sharon Dial. 2003 \$67,000.00 (\$134,000.00 Total) (Arizona Department of Health Services).

Exotic Newcastle Disease Surveillance. Gregory Bradley with Robert Glock, Carlos Reggiardo, Sharon Dial. 2004 \$30,000.00 (\$30,000.00 Total) (USDA).

Request for Funding for the annual meeting of CRWAD. Lynn Joens. 2004 \$29,000.00 (\$29,000.00 Total) (NRI Food Safety).

Technical Assistance and Training in Shrimp Diseases--AQUALMA. Donald Lightner. 1995 \$27,295.00 (\$173,548.00 Total) (AQUALMA, Aquaculture de la Mahajamba, Madagascar).

Exotic Newcastle Disease and Highly Pathogenic Avian Influenza Differential Diagnosis. Gregory Bradley with R. Glock, C. Reggiardo, S. Dial. 2004 \$24,000.00 (\$24,000.00 Total) (Arizona Department of Agriculture).

Disease survey and marketing prospects for specific pathogen free shrimp production on Guam. Kathy F.J. Tang-Nelson with John Brown and George Wall, University of Guam. 2003 \$22,477.00 (\$68,431.00 Total) (T-Star program, USDA).

Disease survey and marketing prospects for specific-pathogen-free shrimp on Guam. Donald Lightner with K.F.J. Tang-Nelson and S. Nelson. 2004 \$22,477.00 (\$67,431.00 Total) (Subcontract from University of Guam, USDA, CSREES, T-Star Special Grant No. 2003-34185-14091).

Strain Variation in Virulence of Clostridium perfringens for Chickens. Glenn Songer. 2003 \$22,126.00 (\$22,126.00 Total) (Schering Plough Animal Health).

NHP in sympatric species. Carlos R. Pantoja Morales. 2004 \$20,000.00 (USDA, CSREES Grant No. 2002-388-08-01345, U.S. Marine Shrimp Farming Program).

Infectious myonecrosis virus (IMNV): A newly recognized virus disease of Litopenaeus vannamei. Carlos R. Pantoja Morales with D.V. Lightner, K.F.J. Tang-Nelson, B.T. Poulos, R.M. Redman. 2004 \$20,000.00 (USDA, CSREES Grant No. 2002-388-08-01345, U.S. Marine Shrimp Farming Program).

Development of an infectivity model to study systemic vibriosis disease in shrimp. Carlos R. Pantoja Morales with L. Mohny and D.V. Lightner. 2004 \$20,000.00 (Schering-Plough Animal Health).

Molecular epidemiology of Giardia. Charles Sterling. 2004 \$16,000.00 (\$16,000.00 Total) (Parasitology Diagnostic Account).

Use of the MagNAPure LC Instrument and Real-time PCR to Develop Detection Methods for Microsporidia in Environmental Water Samples. Charles Sterling with Donna Wolk, Marilyn Marshall. 2002 \$15,000.00 (\$135,000.00 Total) (American Water Works Association).

BVDV in Cattle Southern Arizona. S. Peder Cuneo with Matt McDaniel. 2004 \$14,000.00 (Pfizer Animal Health).

Protection of chicks against necrotic enteritis by immunization with *Clostridium perfringens* alpha toxoid. Glenn Songer. 2004 \$12,341.00 (\$12,341.00 Total) (DowAgrosciences).

NHP: Transmission through water/feces/cannibalism. Carlos R. Pantoja Morales. 2004 \$12,000.00 (USDA, CSREES Grant No. 2002-388-08-01345, U.S. Marine Shrimp Farming Program).

Evaluation of Efficacy of Recombinant Garavax™ Vected Vaccines against Necrotic Enteritis Following Challenge With *Clostridium perfringens* Type A in. Glenn Songer. 2003 \$11,007.00 (\$11,007.00 Total) (Schering Plough Animal Health).

WestNile Virus Surveillance. Robert Glock. 2001 \$10,000.00 (\$10,000.00 Total) (AZ Dept Health Services).

Hepatopancreatic parvovirus (HPV): Sequence and strain-specific markers. Carlos R. Pantoja Morales. 2004 \$10,000.00 (USDA, CSREES Grant No. 2002-388-08-01345, U.S. Marine Shrimp Farming Program).

Arizona BVD-PI Survey. Robert Glock with Matt McDaniel, Peder Cuneo. 2004 \$10,000.00 (\$10,000.00 Total) (Boehringer Ingelheim).

Determination of infectivity of Africa-type IHHNV. Kathy F.J. Tang-Nelson with Lightner DV. 2004 \$10,000.00 (\$10,000.00 Total) (US Marine Shrimp Farming Consortium, USDA).

Pathology of Thailand TSV-comparison of viral load between populations of *Litopeneus vannamei*. Kathy F.J. Tang-Nelson with DV Lightner. 2004 \$10,000.00 (\$10,000.00 Total) (US Marine Shrimp Farming Consortium, USDA).

Molecular mechanisms of trichloroethylene-induced heart malformations. Ornella Selmin. 2003 \$10,000.00 (\$10,000.00 Total) (Sarver Heart Center, U of A).

Characterization of MSGV. Kathy F.J. Tang-Nelson with Lightner DV. 2004 \$10,000.00 (\$10,000.00 Total) (US Marine Shrimp Farming Consortium, USDA).

Development of a PCR method differentiating IHHNV genotypes. Kathy F.J. Tang-Nelson with Lightner DV. 2004 \$10,000.00 (\$10,000.00 Total) (US Marine Shrimp Farming Consortium, USDA).

Determination of MIC Florfenicol against Representative Gram Negative Bacterial Isolates. Donald Lightner. 2004 \$8,000.00 (\$8,000.00 Total) (Schering-Plough Animal Health Corporation).

Molecular and Biochemical characterization of Cryptosporidium epitopes. Charles Sterling with Mike Riggs. 2004 \$8,000.00 (\$8,000.00 Total) (Parasitology Diagnostic Account).

Evaluation of Anti-CSL Based Immunoprophylaxis for Bovine Cryptosporidiosis. Michael W. Riggs. 2002 \$7,543.00 (\$107,264.00 Total) (Boehringer Ingelheim Vetmedica Inc.).

Studies on Taura Syndrome and Exotic Viruses. Donald Lightner. 1995 \$5,000.00 (\$71,000.00 Total) (National Fisheries Institute, Washington, D.C.).

Epidemiology of swine enteric disease in Arizona. Glenn Songer. 2004 \$5,000.00 (\$5,000.00 Total) (Arizona Pork Board).

Role of TlyA in the pathogenesis of *C. jejuni* infections. Stephen J. Billington. 2004 \$5,000.00 (\$9,581.00 Total) (Faculty Small Grant, University of Arizona).

Development of an improved TSV RT-PCR assay. Kathy F.J. Tang-Nelson with Lightner DV. 2004 \$5,000.00 (\$5,000.00 Total) (US Marine Shrimp Farming Consortium, USDA).

Challenge models-Development of the VTR protocol in per os TSV challenge studies. Kathy F.J. Tang-Nelson with Lightner DV. 2004 \$5,000.00 (\$5,000.00 Total) (US Marine Shrimp Farming Consortium, USDA).

Development of a MBV PCR assay with various isolates. Kathy F.J. Tang-Nelson with Lightner DV. 2004 \$5,000.00 (\$5,000.00 Total)

ASM Undergraduate Research Fellowship: Putative autoproteolytic function of the ϕ X174 internal scaffolding protein. Student: Ms. Patricia Fairweather. Bentley Fane. 2003 \$2,500.00 (\$2,500.00 Total) (American Society for Microbiology).

Trich Infection Levels in Arizona Range Bulls. S. Peder Cuneo. 2004 \$2,500.00 (Fort Dodge/Upjohn).

Evaluation of MLV Equine Influenza Vaccine. James K. Collins. 2003 \$1,000.00 (\$5,000.00 Total) (InterVet Inc.).

Mechanisms of adherence and colonization of host epithelial cells by Arcanobacterium pyogenes. Stephen J. Billington with B. Helen Jost, J. Glenn Songer. 2001 \$1,000.00 (\$6,200.00 Total) (USDA/Hatch).

Serum Antibody Levels and Trace Minerals in Range Beef Cattle. S. Peder Cuneo. 2004 \$500.00 (Rancher/AzVDL).

Tonsile Location in Cattle Tongue. S. Peder Cuneo with Dr. R. Glock. 2004 \$200.00 (FSIS (Food Safety Inspection Service) USDA/AzVDL).

Cause of injection site lesions in Holstein steers. S. Peder Cuneo.

Icosahedral Virion Scaffolding Proteins. Bentley Fane. 2003 (\$381,677.00 Total) (NSF).

Mechanisms of adherence and colonization of host epithelial cells by Arcanobacterium pyogenes. B. Helen Jost with Stephen J. Billington and J. Glenn Songer. 2001 (\$6,800.00 Total) (Hatch).

Antibody Production in Sheep. S. Peder Cuneo with V. Guerriero.

Viruses of obligate intracellular parasitic bacteria. Bentley Fane.

Responses of range beef cattle to estrus synchronization. S. Peder Cuneo with R. Ax. 2000 (\$4,500.00 Total) (Pharmacia Upjohn).

Academic Course Report

Veterinary Science & Microbiology

Stephen J. Billington

Course Number	Semester	Units	Ownership	Enrollment
VSC595A	Spring	1	50%	9
VSC595A	Fall	1	100%	8
MIC205A	Fall	3	20%	371
MCB492	1st Summer	4	100%	1
MCB499	Fall	3	100%	1

Gregory Bradley

Course Number	Semester	Units	Ownership	Enrollment
VSC 423	Spring	4	1%	30

James K. Collins

Course Number	Semester	Units	Ownership	Enrollment
MIC 205A	Fall	3	2%	397
VSC533	Fall	4	100%	12
VSC433	Fall	4	100%	63
VSC 438	Spring	3	30%	63

VSC 499(H)	Fall	3	100%	1
PLP 329	Fall	3	5%	12
MIC 340	Fall	3	2%	42
MIC 299	Spring	1	100%	1
VSC 909	Spring	6	100%	1
VSC 900	Spring	4	100%	1
VSC 900	Fall	4	100%	1
VSC 900	1st Summer	2	100%	1
VSC 699	Spring	3	100%	1

S. Peder Cuneo

Course Number	Semester	Units	Ownership	Enrollment
VS 400 B	Spring	3	5%	50
PCOL 471	Fall	3	7%	100
Vet Sci 399	Spring	1	100%	12
VS 195 F	Fall	1	5%	110
PCOL 436	Spring	4	5%	85
VS 443	Fall	3	15%	30
AS 105	Fall	3	5%	20

Janet M. Decker

Course Number	Semester	Units	Ownership	Enrollment
MIC 195A	Spring	1	100%	25
MIC 438	Spring	3	33%	61
VSC 538	Spring	3	33%	4
MIC419web	1st Summer	4	100%	7
MIC 195A	Fall	1	100%	19
MIC 205A	Fall	3	60%	369
MIC 205L	Fall	1	100%	194
MIC 419H	Fall	4	100%	17
V SC 519	Fall	4	100%	16

Sharon Dial

Course Number	Semester	Units	Ownership	Enrollment
VSC 423	Spring	4	3%	18
VSC 498H	Fall	1	100%	1

Bentley Fane

Course Number	Semester	Units	Ownership	Enrollment
MIC285R	Spring	4	100%	120
MIC285L	Spring	1	100%	96

Robert Glock

Course Number	Semester	Units	Ownership	Enrollment
VSC 195F	Fall	1	1%	40

Lynn Joens

Course Number	Semester	Units	Ownership	Enrollment
Mic 454/554	Spring	3	100%	14
VSc 495	Spring	1	100%	50
VSc 205	Spring	3	5%	230

Jennifer Johnson

Course Number	Semester	Units	Ownership	Enrollment
Course Number	Fall	1	100%	1

B. Helen Jost

Course Number	Semester	Units	Ownership	Enrollment
VSC595a	Spring	1	50%	9
MIC399	Spring	2	100%	1
MIC399	Fall	3	100%	1

Donald Lightner

Course Number	Semester	Units	Ownership	Enrollment
VSC 910	Spring	3	100%	1
VSC 920	Spring	9	100%	1
VSC/WFSC456/556	Spring	3	100%	18
VSC 565	1st Summer	3	100%	13
VSC 900	Fall	4	100%	1
VSC 900	Fall	1	100%	1
VSC 900	Fall	1	100%	1
VSC 910	Fall	3	100%	1
VSC 910	Fall	2	100%	1
VSC 910	Fall	6	100%	1
VSC 920	Fall	7	100%	1

Elaine Marchello

Course Number	Semester	Units	Ownership	Enrollment
VSC 400A	Fall	3	100%	75
vsc 401L	Spring	1	100%	16
VSC 499	1st Summer	1	100%	2
VSC 493	Spring	2	100%	3
VSC 499	Spring	3	100%	9
VSC 400B	Spring	3	100%	87
VSC 500B	Spring	3	100%	1
VSC 499	Fall	3	100%	7
TRAD 104	Fall	3	100%	300
VSC 500A	Fall	3	100%	4
VSC 195F	Fall	1	100%	95
VSC 493	Fall	2	100%	11

Carlos R. Pantoja Morales

Course Number	Semester	Units	Ownership	Enrollment
VSC 565	1st Summer	3	20%	20

Michael W. Riggs

Course Number	Semester	Units	Ownership	Enrollment
VSC/MIC 423	Spring	4	95%	21

Ornella Selmin

Course Number	Semester	Units	Ownership	Enrollment
MIC 330	Spring	3	100%	27

Glenn Songer

Course Number	Semester	Units	Ownership	Enrollment
VSC/MIC 420/520	Spring	3	100%	75
VSC/MIC/PLP 329	Fall	1	5%	15
MBIM 552	Spring	3	12%	15
VSC/MIC 421B	Spring	3	100%	50

Charles Sterling

Course Number	Semester	Units	Ownership	Enrollment
VSC 195D	Spring	1	100%	26
VSC 403R	Fall	3	100%	55
VSC 403L	Fall	1	100%	14
VSC 503R	Fall	3	100%	7
VSC 503L	Fall	1	100%	2
MIC 538	Spring	3	40%	4
MIC 438	Spring	3	40%	61

Awards Report

S. Peder Cuneo

Certificate of Achievement, Independent Study: IS-195 Basic Incident Command System. Given by Emergency Management Institute, 7/25/2004.

Certificate of Appreciation, Apache County. Given by Apache County Health Department, 9/12/2004.

Certificate of Appreciation, Tohono O'odam Nation. Given by SARE Rangeland Workshops, Tohono O'odam Nation, 6/11/2004.

Janet M. Decker

Teaching Award. Given by Pi Beta Phi, 11/15/2004.

Teaching Award. Given by Chi Omega, 11/18/2004.

Outstanding Educator of Higher Education. Given by Student Alumni Association, 12/9/2004.

Bentley Fane

CALS Teaching Award. Given by College of Agriculture and Life Sciences, 10/1/2004.

Department Teaching Award. Given by Department of Veterinary Sciences and Microbiology, 5/1/2004.

Elaine Marchello

Woman of Excellence in Agriculture. Given by Sigma Alpha, 4/23/2004.

Outstanding Teaching Award. Given by Dept. of Veterinary Science and Microbiology, 5/6/2004.

Michael W. Riggs

Included in an AED 499 Independent Study of 6 UA faculty recipients of teaching awards in the sciences. Final report: "Experiential Education: The Faculty Perspective". Given by Stacy Sotak, senior student under Dr. Nancy Huber, Associate Professor, CALS Ag Ed, 4/12/2004.

Ornella Selmin

Walkabout for Biosafety Excellence Award. Given by Vice President for Research, U of A, 4/1/2004.

Degrees Awarded to Microbiology and Veterinary Science Majors

	994/001/003	004/011/013	014/021/023	024/031/033	034/041/043	044/051/053
MIC B.S.	17	51	38	36	30	44
MIC BSA	39					
Total MIC	56	51	38	36	30	44
VSC B.S.		37	29	30	36	53
VSC BSA	32					
Total VSC	32	37	29	30	36	53
Total for both majors	88	88	67	66	66	97

Total Enrollment by Semester for Microbiology and Veterinary Science Majors

	984	994	004	014	024	034	044	054
MIC BS	79	40	182	156	154	148	172	212
MIC BSA	149	185						
Total MIC	228	225	182	156	154	148	172	212
VSC BS			236	235	246	228	238	237
VSC BSA	224	218						
Total VSC	224	218	236	235	246	228	238	237
Total Majors	452	443	418	391	400	376	410	449

Pathobiology Degree Awarded by Year

	984	994	004	014	024	034	044	054
M.S.	3	2	5	9	12	6	13	4
Ph.D.	13	13	9	8	7	7	8	2

