

## Waterborne Pathogens

### I. 2008-2009

#### A. Projects

Interactions of *Salmonella enterica* and *E. coli* 0157:H7 with Protozoa from Fresh Produce

S.G. Berk

U.S. Department of Agriculture

#### B. Refereed Publications

Faulkner, G., S.G. Berk, E. Garduño, M.A. Ortiz-Jiménez, and R.A. Garduño. 2008. Passage Through *Tetrahymena tropicalis* Triggers a Rapid Morphological Differentiation in *Legionella pneumophila*. *Journal of Bacteriology*, 190(23), 7728-7738.

#### C. Presentations

Berk, S.G. 2008, October. Amoebae Harbor Novel Potential Pathogens that Slip Under the Radar. Presented at the Department of Environmental Health Seminar, Flinders University, Adelaide, South Australia (Invited Presentation).

Berk, S.G. 2008, October. Amoebae Harbor Novel Potential Pathogens that Slip under the Radar. Presented at the Australian Water Quality Centre, Salisbury, South Australia (Invited Presentation).

Berk, S.G. 2008, October. Amoebae Harbor Novel Potential Pathogens that Slip under the Radar. Presented at a Special Seminar of the Institute for Medical and Veterinary Sciences, University of Adelaide, South Australia (Invited Presentation).

Berk, S.G. 2008, November. Interactions of *Salmonella enterica* and *E. coli* 0157:H7 with Protozoa from Fresh Produce. Presented at the Principal Investigator Meeting of the Biological and Epidemiological Approaches for Food Safety Program of the U.S. Department of Agriculture, Washington D.C.

Berk, S.G. 2009, May. The Isolation and Characterization of Naturally Occurring Amoeba-Resistant Bacteria from Water Samples. Presented at the Region 3 Offices in

Philadelphia at the 2009 U.S. Environmental Protection Agency Workshop on Innovative Approaches for Detecting Microorganisms and Cyanotoxins in Water, Philadelphia, Pennsylvania (Live Webcast).

Berk, S.G. 2008, October. Protozoan as Host for *Legionella* and Other Bacteria. Presented at the *Legionella: Perspectives and Practice* Workshop held at the State Library of South Australia, Adelaide (Invited Presentation).

Berk, S.G. 2008, October. Protozoa and *Legionella* in the Cooling Tower Environment. Presented at the *Legionella: Perspectives and Practice* Workshop held at the State Library of South Australia, Adelaide (Invited Presentation).

Pannell, C.T., and S.G. Berk. 2009, May. Survival Mechanism of Foodborne Pathogens During Passage Through the Ciliate *Tetrahymena*. Presented at the 109th General Meeting of the American Society for Microbiology, Philadelphia, Pennsylvania.

## II. 2007-2008

### A. Projects

Interactions of *Salmonella enterica* and *E. coli* O157:H7 with Protozoa from Fresh Produce

S.G. Berk

U.S. Department of Agriculture

### B. Refereed Publications

Berk, S.G., G. Faulkner, E. Garduño, M.C. Joy, M.A. Ortiz-Jimenez, and R.A. Garduño. 2008. Packaging of Live *Legionella pneumophila* into Pellets Expelled by *Tetrahymena* spp. Does not Require Bacterial Replication and Depends on a Dot/Icm-Mediated Survival Mechanism. *Applied and Environmental Microbiology*, 74, 2187-2199.

Gourabathini, P., M.T. Brandl, K.S. Redding, J.H. Gunderson, and S.G. Berk. 2008. Interactions Between Foodborne Pathogens and Protozoa Isolated from Lettuce and Spinach. *Applied and Environmental Microbiology*, 74, 2518-2525.

**C. Technical Reports and Nonrefereed Publications**

Berk, S.G. 2007. Acquisition of a Confocal Microscope. Final Report to the National Science Foundation.

Berk, S.G. 2008. Microbial Ecology of Food-Borne Pathogens — Role of Protozoa in Pathogen Survival and Maintenance in the Environment. Final Report to the U.S. Department of Agriculture Food Safety Program.

**D. Presentations**

Berk, S.G. 2007, November. Pathogenic Bacteria Associated with Free-Living Amoebae. Presented during the Special Topics Session for the American Water Works Association Water Quality Technology Conference, Charlotte, North Carolina (Invited Presentation).

Brandl, M., P. Gourabathini, and S.G. Berk. 2007, July 28-August 1. Protozoa and Enteric Pathogens: More Than a Grazing Game. Presented at the Annual Meeting of the American Phytopathological Society, San Diego, California.

Garduño, R.A., and S.G. Berk. 2007, December. Mature Intracellular Forms (MIFs) of *Legionella* — Importance of Protozoa in the Infectious Properties and Detection of *Legionella*. Presented at the First Bio-Rad International Symposium of *Legionella*, Venice, Italy.

Pannell, C.T., M.T. Brandl, B. Goodson, M.J.M. Wells, and S.G. Berk. 2008, June. Fate of Food-Borne Pathogens in Expelled Fecal Pellets of a Ciliated Protozoan. Presented at the 108th General Meeting of the American Society for Microbiology, Boston, Massachusetts.

White, J.A., W.G. Willeford, M. Lowe, and S.G. Berk. 2007, October. Environmental Survival of Novel Amoeba-Associated Bacteria. Presented at the Kentucky-Tennessee Branch Meeting of the American Society for Microbiology, Corbin, Kentucky.

Willeford, W.G., J.A. White, M.C. Lowe, M.B. Farone, and S.G. Berk. 2008, June. Environmental Survival of Novel Amoeba-Associated Bacteria. Presented at the 108th General Meeting of the American Society for Microbiology, Boston, Massachusetts.

### III. 2006-2007

#### A. Projects

Biocide Efficacy Against *Legionella pneumophila*

S.G. Berk

Industry

Characterization of a Naturally Occurring Amoeba-Resistant Bacteria from Water Samples

S.G. Berk and J.H. Gunderson

Middle Tennessee State University via the United States Environmental Protection Agency

#### B. Refereed Publications

Berk, S.G., J.H. Gunderson, A.L. Newsome, A.L. Farone, B.J. Hayes, K.S. Redding, N. Uddin, E.L. Williams, R.A. Johnson, M. Farsian, A. Reid, J. Skimmyhorn, and M.B. Farone. 2006. Occurrence of Infected Amoebae in Cooling Towers Compared with Natural Aquatic Environments: Implications for Emerging Pathogens. *Environmental Science and Technology*, 40, 7440-7444.

Tatsumoto, H., Y. Amano, M. Machida, D.B. George, S.G. Berk, and K. Taki. 2006. Prediction of Microcystis Growth as a Function of Nutrient Salts Concentration Based on Lake Origin. *Japanese Journal of Water Treatment Biology*, 42(1), 37-44.

#### C. Book Chapters

Garduno, E., G. Faulkner, M.A. Ortiz-Jimenez, S.G. Berk, and R.A. Garduno. 2006. Interaction with the Ciliate *Tetrahymena* may Predispose *Legionella pneumophila* to Infect Human Cells. In N.P. Cianciotto et al. (eds.), *Legionella: State of the Art 30 Years After Its Recognition*, Washington, D.C: ASM Press.

#### D. Presentations

Berk, S.G. 2006, October. Interactions of *E. coli* O156:H7 and *Salmonella* with Protozoa Isolated from Fresh Produce. Presented during the U.S. Department of Agriculture Principal Investigator's Meeting, Washington, D.C.

Berk, S.G., and P. Gourabathini. 2006, September. Interactions of *E. coli* O157:H7 and Other Pathogens with

Protozoa Isolated from Spinach and Lettuce. Presented at the Kentucky-Tennessee Branch Meeting of the American Society for Microbiology, Cool Springs, Tennessee.

Berk, S.G., L. Janaki, and K.L. Cook. 2007, January. Production of Vesicles Containing Viable *M. paratuberculosis* by Ciliated Protozoa. Presented at the Third Annual Johnes's Disease Integrated Program Conference, College Station, Texas.

Cook, K.L., J. Britt, and S.G. Berk. 2006, September. Detection of *Mycobacterium avium* subsp. *paratuberculosis* in Clinical and Environmental Samples from an Infected Animal. Presented at the American Association of Bovine Practitioners Annual Meeting, St. Paul, Minnesota.

Janaki, L., K.L. Cook, and S.G. Berk. 2006, September. Interactions Between *Mycobacterium avium* subsp. *paratuberculosis* and Protozoa Isolated from a Watering Trough of a Cow with Johnes's Disease. Presented at the Kentucky-Tennessee Branch Meeting of the American Society for Microbiology, Cool Springs, Tennessee.

#### **IV. 2005-2006**

##### **A. Projects**

Microbial Ecology of Food-Borne Pathogens—Role of Protozoa in Pathogen Survival and Maintenance in the Environment

S.G. Berk

U.S. Department of Agriculture

##### **B. Presentations**

Berk, S.G., N. Uddin, M.B. Farone, K.S. Redding, E. Williams, J.H. Gunderson, A.L. Farone, A.L. Newsome, R.A. Johnson, and B.J. Hayes. 2005, October. Cooling Towers—"Hot Spots" for Emerging Pathogens? Presented at the Sixth International Conference on *Legionella*, Chicago, Illinois.

Berk, S.G., W.M. Pugh, M.B. Farone, and J.H. Gunderson. 2005, October. Ciliated Protozoa Release Vesicles Containing Viable Novel Strains of *Legionella*-like Amoebal Pathogens. Presented at the Sixth International Conference on *Legionella*, Chicago, Illinois.

Farone, M.B., B.J. Hayes, C.M. Roden, L.M. Greene, S.G. Berk, and A.L. Farone. 2006, May. The Characterization of a Novel Bacterium Infecting the Nuclei of Human Cells. Presented at the 106th General Meeting of the American Society for Microbiology, Orlando, Florida.

Garduno, E., G. Faulkner, M.A. Ortiz-Jimenez, S.G. Berk, and R.A. Garduno. 2005, October. Interaction with the Ciliate *Tetrahymena* sp. May Predispose *Legionella pneumophila* to Infect Human Cells. Presented at the Sixth International Conference on *Legionella*, Chicago, Illinois.

Gourabathini, P., M.T. Brandl, and S.G. Berk. 2006, May. Interactions Between Foodborne Pathogens and Protozoa Isolated from Lettuce and Spinach. Presented at the 106th General Meeting of the American Society for Microbiology, Orlando, Florida.

Janaki, L., S.G. Berk, and K.L. Cook. 2006, May. Interactions Between *Mycobacterium avium* subsp. *paratuberculosis* and Protozoa Isolated from a Watering Trough of a Cow with Johne's Disease. Presented at the 106th General Meeting of the American Society for Microbiology, Orlando, Florida.

## **V. 2004-2005**

### **A. Projects**

Acquisition of a Confocal Microscope  
S.G. Berk and J.H. Gunderson  
National Science Foundation

Microbial Ecology of Food-Borne Pathogens—Role of Protozoa in Pathogen Survival and Maintenance in the Environment  
S.G. Berk  
U.S. Department of Agriculture

### **B. Presentations**

Berk, S.G. 2005, March. Occurrence of Potential Human Pathogens Lurking in Cooling Towers. Presented at Austin Peay State University, Clarksville, Tennessee.

Berk, S.G. 2004, October. Occurrence of Potential Human Pathogens Lurking in Cooling Towers. Presented at the Kennedy Space Center, Cape Canaveral, Florida (invited presentation).

Berk, S.G. 2004, October. Novel Potential Human Pathogens Lurking in Amoebae of Cooling Towers. Presented at the Kentucky-Tennessee Branch Meeting of the American Society for Microbiology, Bowling Green, Kentucky.

Berk, S.G., J.H. Gunderson, M.B. Farone, A.L. Farone, A.L. Newsome, N. Uddin, and M. Brandl. 2005, February. Interactions of Protozoa with Human Pathogenic Bacteria from Cooling Towers and the Food Industry. Presented at the Tennessee EPSCoR Environmental Summit 2005, Cookeville, Tennessee.

Berk, S.G., W.M. Pugh, M.B. Farone, and J.H. Gunderson. 2005, June. Release of Vesicles Containing Viable Novel Amoebal Pathogens by Ciliated Protozoa. Presented at the 105th General Meeting of the American Society for Microbiology, Atlanta, Georgia.

Farone, M.B., W.J. Skolasinski, K.S. Redding, J.H. Gunderson, A.L. Newsome, S.G. Berk, and A.L. Farone. 2005, June. Isolation of a Novel Amoebal Pathogen from a Hot Tub. Presented at the 105th General Meeting of the American Society for Microbiology, Atlanta, Georgia.

Hayes, B.J., M. Wells, A.L. Farone, S.G. Berk, and M.B. Farone. 2005, June. Use of Biological and Antibiotic Strategies for the Isolation of a Bacterial Amoebal Pathogen from a Cooling Tower Biofilm. Presented at the 105th General Meeting of the American Society for Microbiology, Atlanta, Georgia.