

CHARLES PETER GERBA

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COLLEGE DEGREES

Arizona State University, Tempe, Arizona B. S., Microbiology with Honors	June 1969
University of Miami, Coral Gables, Florida Ph.D., Microbiology	January 1973

CURRENT EMPLOYMENT

Professor, Dept. of Soil, Water and Environmental Science, University of Arizona.

AUMMARY OD WORK HISTORY

Postdoctoral Fellow, Department of Virology and Epidemiology, Baylor College of Medicine, Houston, Texas 77030	1973
Assistant Professor of Environmental Virology, Department of Virology and Epidemiology, Baylor College of Medicine, Houston, Texas 77030	1974-1981
Adjunct Assistant Professor of Environmental Health, University of Texas School of Public Health, Houston, Texas 77030	1976-1983
Associate Professor (1981-1983) and Professor (1983-), Department of Nutrition and Food Science and University Department of Microbiology and Immunology, University of Arizona, Tucson, Arizona 85721	1981-1990
Professor, Department of Soil, Water and Environmental Science The University of Arizona, Tucson, Arizona Phone (602) 621-6906	1990-
Adjunct Professor, Department of Nutritional Sciences The University of Arizona, Tucson, Arizona	1990-

Adjunct Professor, Division of Epidemiology and Biostatistics, The University of Arizona, Tucson, Arizona	2000-
Adjunct Professor, Division of Environmental and Occupational Health, Then University of Arizona, Tucson, Arizona	2010-

AWARDS AND PROFESSIONAL RECOGNITION

Fellow, American Academy of Microbiology	1993
Waksman Lectureship Fellow, American Society for Microbiology	2005-2007
Fellow, American Association for the Advancement of Science	2009
Fellow, International Water Association	2010
Outstanding Research Scientist Award, College of Agriculture, The University of Arizona	1984
Environmental Science and Engineering Fellow, American Association for the Advancement of Science	1984
Service Award for Public Health, Pima County Health Department	1984
Outstanding Team Research Award, College of Agriculture, The University of Arizona	1992
Co-Recipient of Mckee Award (for outstanding contribution to groundwater protection), Water Environmental Federation	
Recipient of the A.P. Black Research Award for outstanding contributions to Water Science, American Water Works Association	1996
Honorary Lifetime Membership Award for dedicated service to the water treatment industry, Water Quality Association	1997
Award of Excellence in Environmental Health for outstanding and innovative research program, The National Association of Country and City Health Officials	1998
Best Paper Published in the Journal of the American Water Works Association, Water Resources Division	2002
Best Paper Published in the Journal of the American Water Works Association. Water Science and Research Division	2005
Shah Distinguished Lectureship in Risk Assessment, Stanford University	2005
Quentin Mees Research Award for outstanding research in applied water science Arizona Water Pollution Control Association	2007

ELECTED POSITIONS IN PROFESSIONAL ORGANIZATIONS

Chairman-elect and Chairman, Applied and Environmental Division of the American Society for Microbiology	1982-1984
President-elect and President, Arizona Branch of the American Society for Microbiology	1983-1984
Councilor, Arizona Branch of the American Society for Microbiology	1985-1986

Chairman-elect and Chairman, Applied and Environmental Division of the American Society for Microbiology	1986-1988
Member - U. S. Environmental Protection Agency Work- shop on "Protocol Development: Criteria and Standards for Potable Reuse and Feasible Alterna- tives", Committee on Groundwater Criteria	1980
Member - U.S. Environmental Protection Agency Work- shop on "Monitoring for Viruses in the Environment"	1980
Member - U.S. Environmental Protection Agency Work- shop on "Microbial Contaminants in Drinking Water"	1981
Member - U.S. Environmental Protection Agency Work- shop on "Land Application of Municipal Wastewater and Sludge", Denver	1983
Member - University Technical Advisory Committee to the Pima County Board of Health	1982-1984
Member - Demonstration Recharge Advisory Committee, Tucson Water, City of Tucson	1984-1987
Member - Technical Advisory Board to the Pima County Water Hyacinth Wastewater Treatment Project	1984
Member - U.S. Environmental Protection Agency, Office of Drinking Water, Workshop on Revised Drinking Water Regulations	1985
Member - Task Force for Microbiological Water Purifier Guide Standards and Testing, Office of Drinking Water, U.S. Environmental Protection Agency	
Member - Pima County Board of Health	1986-1992
Member - Grant Review Panel, Office of Research and Development, U.S. Environmental Protection Agency	1986-1988
Member - Drinking Water Committee, Science Advisory Board, U.S. Environmental Protection Agency	
Member - Task Group on Copper/Silver Ion Generators, National Sanitation Foundation	1989-1991
Member - Technical Advisory Committee, Soil Aquifer Treatment Facility, Santa Ana Watershed Project Authority	1990-1992
Member Ad Hoc - FIFRA Scientific Advisory Panel, Antimicrobial Test Methodology, Office of Pesticides, U.S.	1991-1997
Member - Task Group on Drinking Water Treatment Units for Bacteriostatic Testing and Cyst Reduction, National Sanitation Foundation	1991
Member - "Workshop on Virology for the Water Supply in the Nineties", National Institute of Public Health and Environmental Protection, The Netherlands	1991
Member - "Expert Panel on Hazards of Municipal Solid Waste Recycling," U.S. Environmental Protection Agency	1991-1992
Member - "Workshop of Research Needs in Drinking Water Microbiology", American Water Works Foundation	1992
Member - "Workshop on the Methodology for Deriving National Water Ambient Water Quality Criteria	

for the Protection of Human Health", U. S. Environmental Protection Agency, Office of Science and Technology	1992
Member - "Blue Ribbon Panel on Research needs for Ultraviolet Disinfection", State of California, Dept. of Health Services	1993
Member - "Blue Ribbon Panel on Assessment and Acceptability of Risk", State of Calif., Dept. of Health Services.	1993
Member - Workshop on "Research Needs in Microbial Risk Assessment", National Institute of Public Health and Environmental Protection, The Netherlands	1992
Chairman - Microbiology Working Group "Workshop for Revision of National Guidelines for Deriving Human Health Criteria for Surface Water", U.S. Environmental Protection Agency	1992
Member - Technical Advisory Committee, Water Campus Wastewater Reuse Project, City of Scottsdale	1992-1994
Member - Science Advisory Board, Committee on Drinking Water and Committee on Research Strategies, U.S. Environmental Protection Agency	1994-1999
Member - Working Group on Microbial Risk Assessment, International Life Science Institute and U.S. Environmental Protection Agency	1995-
Member - Project Advisory Committee, UV Disinfection of Groundwater, American Water Works Research Foundation	1994-1996
Member - Project Advisory Committee National Survey of Viruses in Groundwater, American Water Works Association Research Foundation	1995-1999
Member - Working Group on Microbial Risk Assessment. International Life Science Institute and the United States Environmental Protection Agency	1996-2000
Member - Workshop on Managing Microbial Risks of Potable Water in Space NASA	1997
Member - Workshop on New Microbial Indicators for Water, U.S. Environmental Protection Agency	1998
Member - Workshop on Water and Food Pathogen Risk Assessment, U.S. Environmental Protection Agency and the International Life Science Institute	1999
Member - Workshop on Groundwater Indicator Evaluation, U.S. Environmental Protection Agency	1999
Member - Early Warning Monitoring to Detect Hazardous Events in Water Supply Systems U.S. Geological Survey, U.S. Environmental Protection Agency, Dept. of Defense	1999
Member – Susceptibility and Microbial Risk Assessment Workshop Environmental Protection Agency	1999

Member – Research Needs for On-Site Wastewater Treatment Systems Workshop, U. S. Environmental Protection Agency	2001
Member – Recreational Water Quality Standards for Tropical Waters Workshop, U. S. Environmental Protection Agency	2001
Member – Research Needs for Biosolids and Animal Wastes, U.S. Department of Agriculture and U. S. Environmental Protection Agency	2001
Member –Workshop on Indicators for Pathogens in Wastewater, Biosolids and Storm water, Water Environment Research Foundation	2003
Member – Expert Panel to Review Centers for Disease Control Environmental Microbiology Program	2005
Member – Selecting Criteria for the Candidate Contaminate List, U. S. Environmental Protection Agency	2006
Member – Food Advisory Committee, U. S. Food and Drug Administration	2010-present
Member - American Society for Testing Material, subsection committee on standard methods for detecting virus on solids and soils	1977
Member - American Society for Testing Material, subsection committee on standard methods for detecting viruses in fresh and marine waters	1978
Subcommittee on Virological Methods, "Examination of Seawater and Shellfish", pub- lished by the American Public Health Association	1979
Chairman - Workshop on "Ecology of Viruses in Water", Second International Symposium on Micro- bial Ecology, University of Warwick, England	1980
Member - Session Committee, Institute of Food Technologists	1982
Member - Committee on Environmental Microbiology, American Society for Microbiology	1981-1983
Member - Microbial Problems in Drinking Water Committee, American Water Works Association	
Senior Delegate - U.S. Committee of the Inter- national Association for Water Pollution Control and Research for the American Society for Microbiology	1985-1991
Chairman - Enteric Virus Committee, Joint Editorial Board, 17th edition supplement and 18th edition, Standard Methods for the Examination of Water and Wastewater	1989-1997
Member - American Soc. for Microbiology delegate. United States National Committee of the International Water Quality Association (now International Water Association)	1992-1999

Member - Public and Scientific Committee of the American Soc. Microbiology	1996-2006
Member – Workshop on Select Criteria for Drinking Water Candidate Contaminate List, Office of Water, United States Environmental Protection Agency	2006
Member – Scientific Review of the Proposed Risk Assessment Bulletin from the Office of Management and Budget, National Research Council	2006
Member – Review Panel SBIR grant program, U. S. Environmental Protection Agency	2010

PUBLICATIONS

BOOKS (11)

Gerba, C.P., and S.M. Goyal (eds.). 1982. *Methods in Environmental Virology*. Marcel-Dekker, Inc., NY.

Bitton, G., and C.P. Gerba (eds.). 1984. *Groundwater Pollution Microbiology*. John Wiley and Sons, NY.

Goyal, S.M., C.P. Gerba, and G. Bitton. 1987. *Phage Ecology*. John Wiley and Sons, N.Y.

Pepper, I.L., C.P. Gerba, and J.W. Bredecke. 1995. *Environmental Microbiology - A Laboratory Manual*. Academic Press, NY.

Pepper, I.L., C.P. Gerba, and M.L. Brusseau. 1996. *Pollution Science*. Academic Press, San Diego, CA.

Haas, C.N., J.B. Rose, and C.P. Gerba. 1999. *Quantitative Microbial Risk Assessment*. John Wiley, NY.

Maier, R.M., I.L. Pepper and C.P. Gerba. 2000. *Environmental Microbiology*. Academic Press, NY.

Pepper, I.L., C.P. Gerba, and J.W. Bredecke. 2004. *Environmental Microbiology - A Laboratory Manual*. Second Edition. Academic Press, San Diego.

Pepper, I. L., C. P. Gerba and M. L. Brusseau. 2006. *Environmental and Pollution Science*, Second Edition. Academic Press, San Diego.

Maier, R.M., I.L. Pepper and C.P. Gerba. 2008. *Environmental Microbiology*. Second Edition. Academic Press, NY.

PEER REVIEWED JOURNAL ARTICLES (346)

Gerba, C.P., and G.E. Schaiberger. 1973. Biscayne Bay: bacteriological data interpretation. *Flor. Sci.* 36:104-109

- Gerba, C.P., and G.E. Schaiberger. 1975. Effect of particulates on the survival of virus in seawater. *J. Water Pollut. Contr. Fed.* 47:93-103.
- Gerba, C.P., and G.E. Schaiberger. 1975. Aggregation as a factor in loss of viral titer in seawater. *Water Res.* 9:567-571.
- Gerba, C.P., C. Wallis, and J.L. Melnick. 1975. Microbial hazards of household toilets. Droplet production and the fate of residual organisms. *Appl. Microbiol.* 30:229-237.
- Gerba, C.P., C. Wallis, and J.L. Melnick. 1975. The fate of wastewater bacteria and viruses in soil. *Jr. Irrig. Drain. Div. ASCE* 101:157-174.
- Gerba, C.P., M.D. Sobsey, C. Wallis, and J.L. Melnick. 1975. Factors influencing the adsorption of poliovirus onto activated carbon in wastewater. *Environ. Sci. Technol.* 9:727-731.
- Gerba, C.P., C. Wallis, and J.L. Melnick. 1975. Viruses in water: the problem, some solutions. *Environ. Sci. Technol.* 9:1122-1126.
- Farrah, S.R., C.P. Gerba, C. Wallis, and J.L. Melnick. 1976. Concentration of viruses from large volumes of tap water using pleated membrane filters. *Appl. Environ. Microbiol.* 31:221-226.
- Gilbert, R.G., R.C. Rice, H. Bouwer, C.P. Gerba, C. Wallis, and J.L. Melnick. 1976. Wastewater renovation and reuse: virus removal by soil filtration. *Science* 192:1004-1005.
- Gerba, C.P., and J.S. McLeod. 1976. Effect of sediments on the survival of *Escherichia coli* in marine waters. *Appl. Environ. Microbiol.* 32:114-120.
- Gilbert, R.G., C.P. Gerba, R.C. Rice, H. Bouwer, C. Wallis, and J.L. Melnick. 1976. Virus and bacteria removal from wastewater by land treatment. *Appl. Environ. Microbiol.* 32:333-338.
- Farrah, S.R., S.M. Goyal, C.P. Gerba, C. Wallis, and P.T.B. Shaffer. 1976. Characteristics of humic acid and organic compounds concentrated from tapwater using the Aquella virus concentrator. *Water Res.* 10:897-901.
- Payment, P., C.P. Gerba, C. Wallis, and J.L. Melnick. 1976. Methods for concentrating viruses from large volumes of estuarine water on pleated membrane filters. *Water Res.* 10:893-896.
- Lance, J.C., C.P. Gerba, and J.L. Melnick. 1976. Virus movement in soil columns flooded with secondary sewage effluent. *Appl. Environ. Microbiol.* 32:520-526.
- Lance, J.C., and C.P. Gerba. 1977. Nitrogen, phosphate and virus removal from sewage water during land filtration. *Prog. Water Technol.* 9:157-166.

- Farrah, S.R., C.P. Gerba, S.M. Goyal, C. Wallis, and J.L. Melnick. 1977. Regeneration of pleated filters used to concentrate enteroviruses from large volumes of tap water. *Appl. Environ. Microbiol.* 33:308-311.
- Gerba, C.P., C. Wallis, and J.L. Melnick. 1977. Disinfection of wastewater by photodynamic oxidation. *J. Water Pollut. Contr. Fed.* 49:575-583.
- Hobbs, M.F., C.P. Gerba, C. Wallis, J.L. Melnick, and J.S. Lennon. 1977. Photodynamic inactivation of infectious agents. *J. Environ. Eng. Div. ASCE* 103:459-472.
- Sobsey, M.D., C.P. Gerba, C. Wallis, and J.L. Melnick. 1977. Concentration of enteroviruses from large volumes of turbid estuary water. *Can. J. Microbiol.* 23:770-778.
- Farrah, S.R., S.M. Goyal, C.P. Gerba, C. Wallis, and J.F. Melnick. 1977. Concentration of enteroviruses from estuarine water. *Appl. Environ. Microbiol.* 33:1192-1196.
- Gerba, C.P., S.M. Goyal, E.M. Smith, and J.L. Melnick. 1977. Distribution of viral and bacterial pathogens in a coastal canal community. *Marine Pollut. Bull.* 8:279-282.
- Gerba, C.P., E.M. Smith, and J.L. Melnick. 1977. Development of a quantitative method for detecting enteroviruses in estuarine sediments. *Appl. Environ. Microbiol.* 34:158-163.
- Goyal, S.M., C.P. Gerba, and J.L. Melnick. 1977. Occurrence and distribution of bacterial indicators and pathogens in canal communities along the Texas coast. *Appl. Environ. Microbiol.* 34:139-149.
- Gerba, C.P., C. Wallis, and J.L. Melnick. 1977. Application of photodynamic oxidation to the disinfection of tapwater, sea-water and sewage contaminated with poliovirus. *Photochem. Photobiol.* 26:499-504.
- Stagg, C.H., and C.P. Gerba. 1977. Cyanophage as an indicator of animal viruses in wastewater. (Discussion). *J. Water Pollut. Contr. Fed.* 49:1915-1916.
- Melnick, J.L., C.P. Gerba, and C. Wallis. 1977. Viruses in water: an increasing awareness of the problem and approaches to its solution. *J. Viestnik AMN, USSR (J. Acad. Med. Sci., USSR)* 6:70-75, (In Russian).
- Farrah, S.R., S.M. Goyal, C.P. Gerba, R.H. Conklin, C. Wallis, J.L. Melnick, and H.L. Dupont. 1978. A simple method for concentration of enteroviruses and rotaviruses from cell culture harvests using membrane filters. *Intervirology* 9:56-59.
- Gerba, C.P., S.R. Farrah, S.M. Goyal, C. Wallis, and J.L. Melnick. 1978. Concentration of enteroviruses from large volumes of tap water, treated sewage and seawater. *Appl. Environ. Microbiol.* 35:540-548.
- Farrah, S.R., S.M. Goyal, C.P. Gerba, R.H. Conklin, and E.M. Smith. 1978. Comparison between adsorption of poliovirus and rotavirus by aluminum hydroxide and activated sludge flocs. *Appl. Environ. Microbiol.* 35:360-363.

- Farrah, S.R., S.M. Goyal, C.P. Gerba, C. Wallis, and J.L. Melnick. 1978. Concentration of poliovirus from tapwater onto membrane filters with aluminum chloride at ambient pH levels. *Appl. Environ. Microbiol.* 35:624-626.
- Smith, E.M., C.P. Gerba, and J.L. Melnick. 1978. Role of sediment in the persistence of enteroviruses in the estuarine environment. *Appl. Environ. Microbiol.* 35:685-689.
- Stagg, C.H., C. Wallis, C.H. Ward, and C.P. Gerba. 1978. Chlorination of solids-associated coliphages. *Prog. Water Technol.* 10:381-387.
- Goyal, S.M., C.P. Gerba, and J.L. Melnick. 1978. Prevalence of human enteric virus in coastal canal communities. *J. Water Pollut. Contr. Fed.* 50:2247-2256.
- Farrah, S.R., S.M. Goyal, C.P. Gerba, V.K. Mahajan, C. Wallis, and J.L. Melnick. 1978. Concentration of humic acid from tap water. *Water Res.* 12:303-306.
- Hurst, C., S.R. Farrah, C.P. Gerba, and J.L. Melnick. 1978. Development of quantitative methods for the detection of enteroviruses in sewage sludges during activation and following land disposal. *Appl. Environ. Microbiol.* 36:81-89.
- Gerba, C.P., and J.C. Lance. 1978. Poliovirus removal from primary and secondary sewage by soil filtration. *Appl. Environ. Microbiol.* 36:247-251.
- Edmond, T.D., G.E. Schaiberger, and C.P. Gerba. 1978. Detection of enteroviruses near deep marine sewage outfalls. *Marine Pollut. Bull.* 9:246-249.
- Gerba, C.P., C.H. Stagg, and M.G. Abadie. 1978. Characterization of sewage solid-associated viruses and behavior in natural waters. *Water Res.* 12:805-812.
- Gerba, C.P., and S.M. Goyal. 1978. Detection and occurrence of enteric viruses in shellfish: a review. *J. Food Protect.* 41:743-754.
- Melnick J.L., C.P. Gerba, and C. Wallis. 1978. Viruses in water. *Bull. Wld. Hlth. Org.* 56:499-508
- Gerba, C.P., and C.H. Stagg. 1979. Protection of viruses during disinfection by adsorption to particulate matter. (Discussion). *J. Water Pollut. Contr. Fed.* 51:414-416.
- Goyal, S.M., C.P. Gerba, and J.L. Melnick. 1979. R+ bacteria in estuarine sediments. *Marine Pollut. Bull.* 10:25-27.
- Goyal, S.M., C.P. Gerba, and J.L. Melnick. 1979. Transferable drug resistance in bacteria of coastal canal water and sediment. *Water Res.* 13:349-356.

- Wallis, C., J.L. Melnick, and C.P. Gerba. 1979. Concentration of viruses from water by membrane chromatography. *Ann. Rev. Microbiol.* 33:413-437.
- Goyal, S.M., C.P. Gerba, and J.L. Melnick. 1979. Human enteroviruses in oysters and their overlying waters. *Appl. Environ. Microbiol.* 37:572-581.
- Hurst, C.J., and C.P. Gerba. 1979. Development of a quantitative method for the detection of enteroviruses in soil. *Appl. Environ. Microbiol.* 37:626-632.
- Estes, M.K., D.Y. Graham, E.M. Smith, and C.P. Gerba. 1979. Rotavirus stability and inactivation. *J. Gen. Virol.* 43:403-409.
- Smith, E.M., M.K. Estes, D.Y. Graham, and C.P. Gerba. 1979. A plaque assay for the simian rotavirus SA11. *J. Gen. Virol.* 43:513-519.
- Gerba, C.P., R.A.F. Dixon, F.E. Farber, C. Wallis, and J.L. Melnick. 1979. Photodynamic inactivation of fish pathogens. *Develop. Indust. Microbiol.* 20:647-651.
- LaBelle, R.L., and C.P. Gerba. 1979. Influence of pH, salinity and organic matter on the adsorption of enteric viruses to estuarine sediment. *Appl. Environ. Microbiol.* 38:93-101.
- Marzouk, Y., S.M. Goyal, and C.P. Gerba. 1979. Prevalence of enteroviruses in ground water of Israel. *Ground Water* 17:487-491.
- Goyal, S.M., and C.P. Gerba. 1979. Comparative adsorption of human enteroviruses, simian rotavirus and selected bacteriophages to soils. *Appl. Environ. Microbiol.* 38:241-247.
- Melnick, J.L., and C.P. Gerba. 1979. Is the water safe to drink? *J. Infect. Dis.* 139:736-737.
- Gerba, C.P., S.M. Goyal, R.L. LaBelle, I. Cech, and G.F. Bogdan. 1979. Failure of indicator bacteria to reflect the occurrence of enteroviruses in marine water. *Am. J. Publ. Hlth.* 69:1116-1119.
- Estes, M.K., D.Y. Graham, C.P. Gerba, and E.M. Smith. 1979. Simian rotavirus SA11 replication in cell cultures. *J. Virol.* 31:810-815.
- Melnick, J.L., and C.P. Gerba. 1980. The ecology of enteroviruses in natural waters. *CRC Crit. Rev. Environ. Contr.* 10:65-93.
- Gerba, C.P., S.M. Goyal, C.J. Hurst, and R.L. LaBelle. 1980. Type and strain dependence of enterovirus adsorption to activated sludge, soils and estuarine sediments. *Water Res.* 14:1197-1198.

- Lance, J.C., and C.P. Gerba. 1980. Poliovirus movement during high rate land filtration of sewage water. *J. Environ. Qual.* 9:31-34.
- Hurst, C.J., and C.P. Gerba. 1980. Stability of simian rotavirus in fresh and estuarine water. *Appl. Environ. Microbiol.* 39:1-5.
- Goyal, S.M., K.S. Zerda, and C.P. Gerba. 1980. Concentration of coliphages from large volumes of water and wastewater. *Appl. Environ. Microbiol.* 39:85-91.
- Goyal, S.M., H. Hanssen, and C.P. Gerba. 1980. Simple method for the concentration of influenza virus from allantoic fluid on microporous filters. *Appl. Environ. Microbiol.* 39:500-504.
- Goyal, S.M., C.P. Gerba, and J.C. Lance. 1980. Movement of endotoxin through soil columns. *Appl. Environ. Microbiol.* 39:544-547.
- LaBelle, R.L., C.P. Gerba, S.M. Goyal, J.L. Melnick, I. Cech, and G.F. Bogdan. Relationships between environmental factors, bacterial indicators and the occurrence of enteric viruses in estuarine sediments. *Appl. Environ. Microbiol.* 39:588-596.
- Wang, D.S., J.C. Lance, and C.P. Gerba. 1980. Evaluation of various soil water samples for virological sampling. *Appl. Environ. Microbiol.* 39:662-664.
- LaBelle, R.L., and C.P. Gerba. 1980. Influence of estuarine sediment on virus survival under field conditions. *Appl. Environ. Microbiol.* 39:749-755.
- Marzouk, Y., S.M. Goyal, and C.P. Gerba. 1980. Relationship of viruses and indicator bacteria in water and wastewater of Israel. *Water Res.* 14:1585-1590.
- Gerba, C.P., S.M. Goyal, I. Cech, and G.F. Bogdan. 1980. Bacterial indicators and environmental factors as related to contamination of oysters by enteroviruses. *J. Food Protect.* 43:99-101.
- Goyal, S.M., K.S. Zerda, and C.P. Gerba. 1980. Concentration of bacteriophage lysates by filter chromatography. *J. Virol. Methods.* 1:79-85.
- Gerba, C.P., K.C. Hou, R.A. Babineau, and J.V. Fiore. 1980. Pyrogen control by depth filtration. *Pharmaceut. Technol.* 4:83-89.
- Hurst, C.J., C.P. Gerba, J.C. Lance, and R.C. Rice. 1980. Survival of enteroviruses in rapid-infiltration basins during the land application of wastewater. *Appl. Environ. Microbiol.* 40:192-200.
- Liew, P., and C.P. Gerba. 1980. Thermostabilization of enteroviruses by estuarine sediment. *Appl. Environ. Microbiol.* 40:305-308.

- Hou, K., C.P. Gerba, S.M. Goyal, and K.S. Zerda. 1980. Capture of latex beads, bacteria, endotoxin and viruses by charge-modified filters. *Appl. Environ. Microbiol.* 40:892-896.
- Goyal, S.M., and C.P. Gerba. 1980. Simple method for concentration of bacteria from large volumes of tap water. *Appl. Environ. Microbiol.* 40:912-916.
- Hurst, C.J., C.P. Gerba, and I. Cech. 1980. Effects of environmental variables and soil characteristics on virus survival in soil. *Appl. Environ. Microbiol.* 40:1067-1079.
- Keswick, B.H., and C.P. Gerba. 1980. Viruses in groundwater. *Environ. Sci. Technol.* 14:1290-1297.
- Melnick, J.L., and C.P. Gerba. 1980. Viruses in Water and Soil. *Public Health Reviews* 9:185-213.
- Keswick, B.H., C.P. Gerba, and S.M. Goyal. 1981. Occurrence of enteroviruses in community swimming pools. *Amer. J. Public Health* 71:1026-1030.
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- Hejkal, T.W., and C.P. Gerba. 1981. Uptake and survival of enteric viruses in the blue crab, *Callinectes sapidus*. *Appl. Environ. Microbiol.* 41:207-211.
- Wang, D.S., C.P. Gerba, and J.C. Lance. 1981. Effect of soil permeability on virus removal through soil columns. *Appl. Environ. Microbiol.* 42:83-88.
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- Schaiberger, G.E., T.D. Edmond, and C.P. Gerba. 1982. Distribution of enteroviruses in sediments contiguous with a deep marine sewage outfall. *Water. Res.* 16:1425-1428.
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- Hejkal, T.W., C.P. Gerba and V.C. Rao. 1982. Reduction of cytotoxicity in virus concentrates from environmental samples. *Appl. Environ. Microbiol.* 43:731-733.

- Smith, E.M., and C.P. Gerba. 1982. Development of a method for the detection of human rotavirus in water and sewage. *Appl. Environ. Microbiol.* 43:1440-1450.
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- Keswick, B.H., D.S. Wang, and C.P. Gerba. 1982. The use of microorganisms as groundwater tracers: a review. *Ground Water* 20:142-149.
- Lance, J.C., C.P. Gerba, and D.S. Wang. 1982. Comparative movement of different enteroviruses in soil columns. *J. Environ. Qual.* 11:347-351.
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MENTORING OF ENVIRONMENTAL SCIENTISTS AND OTHER STUDENTS -

LIST OF THESES AND DISSERTATIONS DIRECTED

1. LaBelle, Raymond. Ph.D., 1979. The role of sediment in the ecology of enteric viruses in the marine environment. Systems Analyst. Honeywell Corp., Houston, TX
2. Smith, Eric. Ph.D., 1980. Development of a method for detection of rotavirus in water. Professor of Microbiology, University of Texas Medical School at Galveston, TX.

3. Hurst, Christian. Ph.D., 1980. Viral detection and persistence during the land treatment of sludge and wastewater. Environmental Virologist, Risk Reduction Laboratory, U.S. Environmental Protection Agency, Cincinnati, OH. (Retired).
4. Zerda, Katherin S. Ph.D., 1982. Adsorption of viruses to charge-modified silica. University of Houston, Houston, TX.
5. Hurst, Pei-Fung Liew. Ph.D., 1982. Development and evaluation of an enzyme-linked immuno-sorbent assay for the detection of viruses from wastewater. Senior Group Leader, Dames and Moore, Environmental Consulting Engineers. Cincinnati, OH.
6. Soria, Gary A. Toranzos. M.S., 1983. Development of a microporous filter method for concentration of rotavirus from tap water. Professor, Dept. of Biology, University of Puerto Rico, Rio Piedras, PR.
7. Bassous, Marlene. M.S., 1983. Use of dyes and proteins as indicators of virus adsorption to soils. Clinical Laboratory Supervisor, VA.
8. Yates, Marylynn V. Ph.D., 1984. Virus persistence in groundwater. Professor, Department of Environmental Science, Univ. of Calif., Riverside, CA.
9. Toranzos, Gary A. Ph.D., 1985. Occurrence of enteric viruses in drinking water in South America. Professor, Dept. of Biology, University of Puerto Rico, Rio Piedras, PR.
10. Musial, Coral A. Ph.D., 1985. Development of a method for the detection of *Cryptosporidium* in water and selected studies on hepatitis A virus. Physician, Dept. of Infectious Disease, University of Ill., Champaign, IL.
11. Mullinax, Rebecca L. M.S., 1985. Isolation of enteric viruses from the recreational waters of Oak Creek. Research Associate, University of Calif. at Davis, CA.
12. Rose, Joan B. Ph.D., 1985. Virus removal during conventional drinking water treatment. Professor, Dept. Fisheries and Wildlife, Michigan State University, East Lansing
13. Payne, Holly. M.S., 1985. Development of methods for enteric virus detection in freshwater clams. Quality Control Supervisor, Soufer Foods, NC.
14. Margolin, Aaron B. Ph.D., 1986. Use of cDNA-blot hybridization techniques for detection of enteric viruses in water. Professor and Head, Dept. of Microbiology, University of New Hampshire, Durham, NH.
15. Badaway, Amin S. Ph.D. Survival and detection of enteric viruses on vegetables. Professor, Mosul, Iraq.

16. Thurman, Robert. Ph.D., 1987. Mechanisms of virus inactivation on modified soil surfaces. Professor, Australian Catholic University Ballarat, Victoria.
17. Sun, Gwoshing. M.S., 1986. Gray water reuse for irrigation.
18. Madore, Mary. M.S., 1986. Resistance to *Cryptosporidium* to chlorine disinfection.
19. Grondin, Gerry. M.S., 1987. (Co-advisor). Modeling virus transport in ground water. National Groundwater Modeling Center, OH.
20. Kayed, Dima. M.S., 1986. Methods for the isolation of oocysts of *Cryptosporidium* from sludge and *Giardia* cysts from stool. Ph.D. Lecturer, Univerity os Jordan, Aman, Jordan.
21. Bradford, Alan. M.S., 1987. (Co-advisor) Transport of MS-2 virus through saturated soil columns. Working for a bioremediation company in Irvine, CA.
22. Messina, Maria Cipolla. M.S., 1989. The effect of liquid smoke on *Listeria Monocytogenes*. Working for a biotechnology company in New Jersey.
23. Landeen, Lee Kevin. M.S., 1989. Inactivation of *Legionella pneumophila* by copper, silver ions and free chlorine. Working for a biotechnology company in San Diego, CA.
24. Manthriratna, Gothami Anoma. M.S., 1989. Efficacy of handwashing as an aid in the control of rotavirus and *Giardia* transmission. Research Associate, Boston University, Boston, MA.
25. Kroeger, Thomas William. M.S., 1989. (Co-advisor) Hydrophobic partitioning of the bacteriophage MS-2. Dept. of Water Resources, State of Wisconsin.
26. Stocking, Kristin. M.S., 1989. (Co-advisor) Adsorption of MS-2 bacteriophage to silica. Hydrologist, City of Tucson, AZ.
27. Richardson, Kenneth James. Ph.D., 1989. Use of nucleic acid probes on a nonradioactive labeling system for the detection of enteroviruses in water. Environmental Lawyer in private practice.
28. DeLeon, Ricardo. Ph.D., 1989. Use of gene probes and an application method for the detection of rotaviruses in water. Head, Microbiology, Metropolitan Water District, LaVerne, CA.
29. Hinkle, Stephen. M.S., 1990. (Co-Advisor) Modeling colloid transport in saturated porous media: an assessment of the importance of pH and kinetics in virus transport. Hydrologist, State of Washington.
30. Cassels, Jenna Marie. M.S., 1990. Inactivation of *Naegleria fowleri* amoebas by copper, silver and chlorine. Research Microbiologist, MBX Corporation, Tucson, AZ

31. Luedeman, Rene Annette. M.S., 1990. (Co-advisor) Development of *in vitro* primary cell cultures from the penaeid shrimp, *penaeus stylirostris* and *penaeus vannamei* and evaluation of a potential application. Research Associate, University of Arizona, Tucson, AZ.
32. Soares, Ana Cristina Fermino. M.S., 1990. Occurrence of enteroviruses and *Giardia* cysts in sewage sludge before and after anaerobic digestion.
33. Zhou, Xia. M.S., 1991. Inactivation of *Escherichia coli* and coliphage MS-2 by chloramine and copper. Working for a biotechnology company in Los Angeles, CA.
34. Kinoshita, Takashi. M.S., 1991. Effects of pH and hydrophobicity on the transport of viuses and bacteria in saturated media. Working with a consulting Engineering Firm in Japan.
35. Chiou, Ipeng. M.S., 1991. (Co-advisor) Inactivation of *Listeria monocytogenes* by copper, silver ions and free chlorine. Microbiologist, Hunts Foods, Los Angeles, CA.
36. Straub, Timothy Mark. M.S., 1991. Inactivation of bacteriophages MS-2 and PRD1 and poliovirus type 1 in Pima clay loam and Brazito sandy loam soils amended with anaerobically digested sewage sludge. Research Scientist, Battelle Labs Northwest. Richmond, WA.
37. Abbaszadegan, Morteza. Ph.D., 1991. Detection of *Giardia* cysts by cDNA probe and application to water samples. Professor, Dept. of Environmental Engineering, Arizona State University, Tempe, AZ.
38. Huber, Mary Susan. M.S., 1992. Occurrence of enteric viruses in disposable diapers from three landfills.
39. Lenczewski, Melisa E. M.S., 1993. Comparative transport of bacteriophage and microspheres in an aquifer under forced-gradient conditions. Associate Professor, Dept. of Geology, University of Northern Illinois.
40. Straub, Timothy Mark. Ph.D., 1993. (Co-advisor). Detection of enteroviruses and hepatitis A virus in sludge and sludge amended soil using the polymerase chain reaction. Research Scientist, Battelle Labs Northwest. Richmond, WA.
41. Hasan, M.N., M.S. 1994. Evaluation of a microbial water purifier for inactivation/removal of viruses, *Giardia lamblia* cysts, and *Cryptosporidium* oocysts, Project Officer, American Water Works Research Foundation, Denver, CO.
42. Enriquez, Carlos. Ph.D., 1994. Detection and Survival of Selected Viruses in Water. Professor, Xaier Univerisity, CA.
43. Ma, Ju-Fang. Ph.D., 1995. Development of methods for concentration and detection of enteroviruses in water. Physician, NY.

44. Reynolds, Kelly A. Ph.D., 1995. Detection of enteroviruses in marine waters using RT-PCR. Associate Professor, College of Public Health, University of Arizona, Tucson, AZ.
45. Meng, Q.S. 1995. Comparative inactivation of enteric adenovirus, poliovirus, and coliphages by ultraviolet irradiation.
46. Johnson, Dana C. Ph.D., 1996. The fate of *Giardia* and *Cryptosporidium* in marine water. Microbiologist. San Jose, CA.
47. Crabtree, Kristina D. Ph.D., 1996. Risk assessment of virus in water. Associate Professor. College of Public Health, University of Texas, El Paso, TX.
48. Asthana, Seema, M.S. 1996. Influence of hydrocarbons on the virulence factors associated with *Pseudomonas aeruginosa*, Research Director, Gen-Probe, San Francisco, CA.
49. Carroll, Sean M. M.S., 1996. Evaluations of virus removal by sandy soils during soil-aquifer treatment using indigenous bacteriophage as indicator organisms. Consulting Engineering Firm, Boulder, CO.
50. Falabi, Jeanne A. M.S., 1996. Pathogen removal by duckweed (*Lemna gibba* L.) - covered pond.
51. Vinluan, Edlin Artruz. M.S., 1996. Survival of microbial indicators in a constructed wetland.
52. Panelli, Manuela. M.S., 1996. Concentration and detection of *Septata intestinalis* in water. Instructor at a junior college, Dallas, TX.
53. Thurston, Jeanette Ann. M.S., 1997. Fate of pathogenic and indicator microorganisms in two subsurface multispecies constructed wetlands. Director, Epidemiology and Food Safety, NRI, USDA, Washington, DC.
54. Kamper, Matthew Frederic. M.S., 1997. The occurrence of microsporidia in environmental waters.
55. Nokes, Rita Lynn. M.S., 1998. Reduction of enteric viruses in small scale, subsurface flow constructed wetlands. Graduate Student, Northwestern University, Chicago, IL.
56. Papp, Julie Dawn. M.S., 1998. The concentration of animal waste to the microbial load of municipal solid waste. Reserved Technician, City of Hope, Los Angeles, CA.
57. Sabalos, Constantine Marc. M.S., 1998. Detection of enteric viruses in treated wastewater sludge using cell culture and molecular methods. Microbiologist. Biotechnology Company, Tucson, AZ.
58. Manshadi, Faezeh Dehghan. M.S., 1998. Occurrence of indicator and pathogenic enteric microorganisms in natural wetlands. Instructor, California East University.

59. Watson, Suzanne Michelle. M.S., 1999. Bacterial Survival during laundering with and without disinfectants. Microbiologist East Bay Municipal District, Oakland, CA.
60. Mahalahabis, Madhumita. M.S., 1999. Detection of infectious poliovirus by multiple passage ICC-PCR and cell culture. Graduate student, University of Washington, Seattle, WA.
61. Chaidez, Quiroz Cristobal. Ph.D., 1999. Risk assessment of selected opportunistic pathogens in drinking water: Director, Centro de Investigacion en Alimentacion y Desarrollo, Culican, Mexico.
62. Quinonez-Diaz, Maria de J. Ph.D., 1999. Removal of pathogens and indicator organisms by natural wetlands. Microbiologist. Centro de Investigacion en Alimentacion y Desarrollo, Culiacan, Mexico.
63. Karim, Mohammad R. Ph.D., 1999. Survival of indicator bacteria and enteric pathogens in wetlands. Research Microbiologist, U. S. Environmental Protection Agency. Cincinnati, OH.
64. Watt, Pamela. M.S., 1999. Research Specialist, Agricultural Research Service, USDA, Salinity Labs, Riverside, CA.
65. Sanchez, Luis R., Ph.D. 1999. Pathogen removal in dairy wastewater using a wastewater constructed treatment system with wetland cells. Quality Control Supervisor, produce company, Los Angeles, CA.
66. Gramos, Dawn M. M.S. 2000. Inactivation of selected enteric viruses using ultraviolet light. Hazardous Waste Risk Manager. U.S. Dept. of Defense. Kwajalein Atoll, Marshall Islands.
67. John, David. M.S. 2000. Inactivation of *Encephalitozoon intestinalis* by chlorine and ultraviolet light. Research Associate, University of South Florida.
68. Vladich, Frank, M.S. 2000. Development of a method for concentration of microsporidia from water. Research Specialist, University of Arizona, Tucson, AZ.
69. Vidales, Juan A. Ph.D. 2001. Removal of viruses and pollution indicators in constructed wetlands. Professor, Univ. of Monterrey, Mexico.
70. Alum, Absar, Ph.D. 2001. Control of viral contamination of reclaimed irrigated vegetables by drip irrigation. Research Associate, Food and Drug Administration, Chicago, IL..
71. Thurston, Jeanette A. Ph.D., 2001. Occurrence of human pathogens microsporidia in irrigation water and ultraviolet light and chlorine inactivation of enteric adenovirus type 40 and feline calicivirus. Director, Epidemiology and Food Safety, NRI, USDA, Washington, DC.
72. Orosz-Coghan, Patricia. A., M.S. 2001. Impact of wildlife on *Escherichia coli* in a constructed wetland. Senior Research Specialist, University of Arizona, Tucson, AZ.

73. Crenshaw, Tristen. N. M.S., 2002. Survival of enteric bacteria in chicken manure utilized as vegetable crop fertilizer. Research Specialist, University of Arizona.
74. Carreon, Joesph. D. M.S., 2003 Risk of infection by *Campylobacter*, *Salmonella*, and Norwalk virus in commercially grown oysters: a novel application of quantitative microbial risk assessment. Research Assistant, George Washington University, Washington.
75. Seidel, Georgetta Ph.D., 2003 Detection on non-CPE producing enteroviruses via ICC-PCR at waste water land application sites in Arizona and California; Endocrine disruption activity after wetland, pond, and soil aquifer treatment of wastewater. Senior Epidemiologist, Tucson Medical Center, Tucson, AZ.
76. Manshadi, Fashi. D. Ph.D., 2003. Occurrence of pathogenic and indicator microorganisms on produce irrigated with dairy wastewater. Instructor California East University, CA.
77. Kayed, D. Ph.D. 2003. Microbial quality of irrigation water used in the production of fresh produce in Arizona. Microbiologist. Phoenix, AZ.
78. Bright, K. Ph.D. 2003. Reduction of pathogenic bacterial populations on stainless steel by silver and zinc ions: potential use in preventing cross contamination of environmental surfaces. Assistant Research Scientist, University of Arizona. Tucson, AZ.
79. Woo, H. M.S. 2004. Bacteriophage surrogate for human enteric viruses in the testing of point-of-use (POU) devices. Microbiologist. Analytical Associates, VT.
80. Balkhyour, M. Ph.D. 2004. Factors that affect respirator fit- testing programs. Professor, Saudi Arabia.
81. Tanner, B. D. Ph.D. 2004. Aerosolization of microorganisms and risk of infection from reuse of wastewater residuals. President, Micobiotest, Austin, TX..
82. Stine, S. W. Ph.D. 2004. Survival of enteric pathogens on the surface of fresh produce and intake of heterotrophic bacteria in the United States. U. S. Environmental Protection Agency. Dallas, TX.
83. Sutton, S. J. M.S. 2004. Inactivation of *Encephalitozoon intestinalis* by chlorine dioxide. Microbiologist. Aerotech Labs, Phoenix, AZ.
84. Law, B. F. Ph.D. 2005. Assessment of the pathogenicity of *Campylobacter* from broiler chickens. Associate Research Scientist, University of Arizona.
85. Boone, S. 2005. Ph.D. Occurrence and persistence of viruses on fomites. Research Scientist, Agricultural Research Service, United States Department of Agriculture, New Orleans, LA.

86. Jones, E. L. Ph.D. 2006. Norovirus in recreational waters of Arizona. Microbiologist. Public Health Specialist. Clorox Company. Pleasanton, CA.
87. Black, S. M.S. 2006. Determination of Ct values of resistant enterovirus by chlorine inactivation. Research Specialist, University of Arizona.
88. Bronson-Lowe, D. L. Ph.D. 2006. Impact of an environmental hygiene intervention on illness and microbial levels in child care centers. Epidemiologist. State of Arizona Department of Health. Phoenix, AZ.
89. Chattman, M. M.S. 2006. Bacterial contamination of liquid hand soaps. Research Technician. University of Arizona. Tucson, AZ.
90. Blair, Barbara. M.S. 2006. Occurrence of *Naegleria fowleri* in wells in Arizona.
91. Castro, Nehelia. 2007. Ph.D. Survival of enteric bacteria and viruses in biosolids. Research Scientist, Center for Food Safety and Biotechnology. Culiacan, Mexico.
92. Goartares-Moroyoqui, Pablo. 2007. Ph.D. Microbiological water quality in irrigation water, treated wastewater, and untreated wastewater and its impact on vegetables in Sonora, Mexico. Director of Biotechnology Programs, Sonora Institute of Technology. Obregon, Sonora.
93. Ruelas, Enue Erdemely Sicaros. 2007. Ph.D. The development of alternative methods of disinfection. Research scientist. The Clorox Company. Pleasanton, CA.
94. Marrero-Ortiz, Roberto. 2007. Ph.D. Assessment of the microbial and chemical water quality of individual and small water groundwater supplies in Arizona. Research Associate. WI.
95. Rodriguez, R. A. 2007. Ph.D. Occurrence of enteric viruses on combined sewer overflows. Assistant Professor. University of Texas School of Public Health. El Paso, TX.
96. Carpenter, K. 2007. M. S. The ecology of bacterial pathogens and *Salmonella* in Irrigation canals. Laboratory Manager. The Clorox Company. Oakland, CA
97. Moghe, A. 2007. M.S. Persistence of bacteria on fomites.
98. Carpenter, K. S. 2007. M.S. Occurrence and survival of fecal bacteria in water and sediment from canals used to irrigate produce. Microbiology Laboratory Manager, Clorox Company, Pleasanton, CA.
99. Henley, J. B., 2008. M.S. Determining inactivation rates of viruses on indoor surfaces. Research Tech. Midwest University, Phoenix, AZ.

100. Sarkar, P. 2008. Ph.D. Occurrence and control of *Naegleria fowleri* in well water. Postdoctoral Research Fellow. Dept. of Environmental Science, Environmental Laboratory Director, City of San Jose. San Jose, CA.
101. Gundy, P. 2008. M.S. Survival of coronaviruses in water and wastewater. Senior Research Specialist. University of Arizona. Tucson, AZ.
102. Fong, Florence. 2008. M.S. Environmental testing laboratory, Vermont.
103. Fankem, S. L. Ph.D. 2009. The role of fomites in the transmission of norovirus. Postdoctoral Fellow, University of Arizona, Tucson, AZ.
104. Yepiz, Maria Suanaa. Ph.D. 2009. Occurrence of bacteria in dishcloths used in restaurants and survival of respiratory viruses on produce. Assistant Professor, University of Sonora.
105. Nordstrom, J. M. Ph.D. 2009. Evaluation of the occurrence and risk of microbes in laundry and laundry-associated surfaces. Director risk management, Veterans Hospital, Tucson, AZ.
106. Fillar, J., M.S. 2009. Bacteria persistence in sediments. Environmental scientist. Environmental consulting environmental firm in Tucson, AZ.
107. Ikner, Luisa A. Ph.D. 2010. Development of a new microporus method for the concentration of viruses from water. Director of Virology, MicroTest Labs, Austin, TX.
108. Gilling, Damian H. Ph.D. 2011. The efficacy of natural plant antimicrobials against *Escherichia coli*. Instructor, Pima College, Tucson, AZ
109. Torres Oscar H. Ph.D. 2011. Copper resistant bacteria better tolerate commercially available antimicrobial treatments based in silver and silver-copper ions.
110. Soto, Johana Marcela. Ph.D. 2011. Assessing efficacy of nanocream filters from virus concentration from water: Risk assessment for *Listeria* and *Salmonella* in food. Scientist. The Clorox Company. Pleasanton, CA.

POSTDOCTORAL FELLOWS

1. Dr. Samuel Farrah, Professor of Microbiology, Department of Microbiology and Cell Science, University of Florida, Gainesville, FL. (retired)
2. Dr. Pierre Payment, Professor of Microbiology, Institute Armand-Frappier, University of Quebec, 531, Blv. Des Prairies, Laval-des-Rapides, Quebec, Canada.

3. Dr. Sagar Goyal, Professor of Microbiology, Veterinary Diagnostic Laboratories, College of Veterinary Medicine, University of Minnesota, St. Paul, MN.
4. Dr. Bruce Keswick, Director of Global Microbiology, Proctor and Gamble Co., Cincinnati, OH.
5. Dr. Thomas Hejkal, Physician, Lincoln, NE.
6. Dr. De-Shin Wang, Compac Computers, Houston, TX.
7. Dr. Marylynn Yates, Professor, Department of Soil and Environmental Science, University of California, Irvine, CA.
8. Dr. Shri N. Singh, Professor, Director of Diagnostic Microbiology, University of Kentucky, Hopkinsville, KY.
9. Dr. Susan Stramer, Research Scientist, Centers Disease Control, Atlanta, GA.
10. Dr. Susan M. Bradford (Kutz), Private consultant to the water industry, Fountain Valley, CA.
11. Dr. Joan Rose, Professor, Department of Fisheries and Wildlife, Michigan State University, East Lansing, MI
12. Dr. Aarron Margolin, Professor and Chairman, Department of Microbiology, University of New Hampshire, Durham, NH.
13. Dr. Morteza Abbaszadegan, Professor, Department of Environmental Engineering, Arizona State University, Tempe, AZ.
14. Dr. David K. Powelson, Assistant Research Scientist, University of Florida, Gainesville.
15. Dr. Timothy Straub, Research Scientist, Battelle Labs Northwest. Richmond, WA.
16. Dr. Patricia Rusin, Associate Research Scientist, Dept. of Soil, Water and Environmental Science, University of Arizona, Tucson, AZ.
17. Dr. Carlos Enriquez, Professor, Xavier College, CA
18. Dr. Dana Johnson, Microbiologist, San Jose, CA.
19. Dr. Kelly Bright, Assistant Research Scientist, University of Arizona, Tucson, AZ.
20. Dr. Stephanie Boone, Research Scientist, Agricultural Research Service, New Orleans, LA.

21. Dr. Ryan Sinclair, Assistant Professor, Loma Linda University, Calif.
22. Dr. Masacki Katjima, current