

## **NWRI Expert Panel for the California Department of Public Health**

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CV for Proposed Expert Panel Member:

- Walter Jakubowski

February 2014

## CURRICULUM VITAE

NAME: Walter Jakubowski

PHONE: 509-448-3535

Email: waltjay@yahoo.com

ADDRESS: 4511 E. 42<sup>nd</sup> Avenue  
Spokane, WA 99223-1590 USA

### EDUCATION:

Brooklyn College of Pharmacy, Long Island University, Brooklyn, N.Y. Attended from 9/57 to 6/61

B.S. cum laude in Pharmacy Awarded June 1961

Oregon State University, Corvallis, Oregon

Attended from 9/66 to 6/68

M.S. in Microbiology Awarded June 1969

University of Minnesota, Minneapolis, Minnesota

Attended Graduate Summer Session June and July, 1977

Completed coursework in Fundamentals of Epidemiology and Fundamentals of Biostatistics; Certificate awarded

University of Minnesota, Minneapolis, Minnesota

Attended Graduate Summer Session June and July, 1979

Completed coursework in Epidemiology of Infectious Diseases and in Clinical Trials; Certificate awarded

### EXPERIENCE (Dates, employers, position title, and area of work, USPHS Commissioned Officer grade):

07/97- Present

Owner, WaltJay Consulting, Spokane, WA USA.  
Clients have included: U.S.E.P.A.; Science Applications International Corporation; GF Craun & Associates; Pfizer Ltd.; Versar, Inc.; Lovelace Clinic Foundation; Cadmus, Inc.; P&G; ICFI Consulting, et al.

02/94 – 07/97

U.S.EPA, AWBERC,NERL, Human Exposure Research Division, Cincinnati, Ohio 45268 - EPA Director, Technical Advisor. In a Division with about 50 staff members, provide expertise and

- conduct research on microorganism methods, occurrence and significance in the environment.  
Grade: CO-06
- 08/88 – 02/94 U.S. EPA, AWWERC, EMSL, Microbiology Research Division, Cincinnati, Ohio 45268 - Chief, Parasitology & Immunology Branch. Supervise 5-7 people in a research program on parasitic contaminants of water, wastewater and sludge, and on immunological methods for the detection and identification of environmental contaminants.  
Grade: CO-06
- 10/81 - 08/88 U.S. EPA, AWWERC, HERL, Toxicology & Microbiology Division, Cincinnati, OH 45268 - Chief, Parasitology & Immunology Section. Supervise research on health effects/microbial contaminants in water and wastewater; supervise 5-7 people in projects dealing with protozoa, helminths and immunology; project officer on extramural studies of health effects associated with water supplies and irrigation of wastewater.  
Grade: CO-06
- 09/76 - 10/81 U.S. EPA, ERC, HERL, Cincinnati, Ohio 45268 Chief, Bacterial & Parasitic Diseases Group. Supervise a research program on health effects of microbial contaminants of water and wastewater; supervise 5-7 people in projects dealing with bacteria, viruses, and protozoa; project officer on extramural studies of health effects associated with water supplies and wastewater treatment and disposal.  
Grade: CO-05
- 06/73 - 09/76 U.S. EPA, ERC, HERL, Cincinnati, Ohio 45268 Virologist. Improve and evaluate methods for concentrating and detecting human enteric viruses in drinking water.  
Grade: CO-05
- 06/68 - 06/73 U.S. EPA, NWW SRL, Gig Harbor, Washington Virologist. Develop methodology for concentrating and detecting human enteroviruses in drinking and estuarine waters; maintain tissue culture laboratory.  
Grade: CO-04
- 08/66 - 06/68 DHEW, USPHS, WSSR, NCUIH, Corvallis, Oregon - Microbiologist (Student). Complete requirements for obtaining a Master of Science degree in microbiology. Conduct thesis

research on adsorption of poliovirus by marine silt and clay in estuarine water.

Grade: CO-04

09/64 - 08/66

DHEW, USPHS, PNW Shellfish Sanitation Laboratory, Gig Harbor, Washington - Research Microbiologist. Conduct studies on accumulation and elimination of bacteria and bacterial viruses by oysters and clams.

Grade: CO-03

08/62 - 09/64

DHEW, USPHS Hospital, San Francisco, California -Staff Pharmacist. Manufacture, prepare, and dispense pharmaceutical preparations for hospital inpatients and outpatients.

Grade: CO-03

07/61 - 08/62

DHEW, USPHS Hospital, Norfolk, Virginia - Pharmacy Intern. Became familiar with all phases of PHS hospital pharmacy; manufacture, prepare, and dispense pharmaceuticals for hospital inpatients and outpatients.

Grade: CO-01

#### PROFESSIONAL MEMBERSHIPS:

American Society for Microbiology  
American Water Works Association  
International Water Association

#### COMMITTEES AND BOARDS:

APHA Water and Wastewater Committee, 1984  
Chairman, Sec. 912 - Pathogenic Microorganisms Joint Task Group,  
APHA Standard Methods, 16th and 17th Edition  
Chairman, Sec. 9711 - Pathogenic Protozoa Joint Task Group, APHA  
Standard Methods, 18th Edition, 1990-92  
Member, Sec. 913 Viruses JTG, APHA Standard Methods, 15-17<sup>th</sup> Eds.  
Pathogenic Suite Committee, USEPA, 1976-1986  
WPCF Safety and Health Committee, 1985-1987  
Pathogens Equivalency Committee, Office of Water, USEPA, 1986-1997  
Microbiological Methods Manual Steering Committee, 1987-1995  
Chairman, ASTM Section on Pathogenic Protozoa, Committee D.19 on  
Water, 1987-1997  
Chairman, ASTM Section on Helminths, Committee D.19 on Water, 1992-94  
Member, Sec. 9060, Samples JTG, APHA Standard Methods, 18th Ed., 1990-92  
Editorial Board, International Journal of Environmental Health

Research, 1990-present  
Member, Organisms in Water Committee and Waterborne Disease  
Outbreaks Subcommittee, American Water Works Association, 1990-1994  
Publications Board Member, American Public Health Association, 1992-1997  
Chair, Sec. 9711-Pathogenic Protozoa JTG, APHA Standard Methods, 20<sup>th</sup>  
Edition, 1995-1999  
Chair, Sec. 9711-Pathogenic Protozoa JTG, APHA Standard Methods, 21<sup>st</sup>  
Edition, 1999-2005  
Chair, Technical Task Force on Developmental Status of Environmental  
Sampling/Water Testing Surrogate Indicators for *Cryptosporidium* Centers for  
Disease Control & Prevention Working Group on Waterborne Cryptosporidiosis, 1995-  
2001.

#### HONORS AND AWARDS:

Rho Chi Honor Society, 1961  
USPHS Clinical Society Pharmacy Award, 1963  
Sigma Xi Society, 1968  
Nominated for U.S. EPA Scientific Achievement Award, 1979 & 1984  
USEPA Bronze Medal re Giardia, 1984  
USPHS Commendation Medal, re Wastewater Sludge Program, 1991  
USEPA Gold Medal re Milwaukee Cryptosporidium outbreak, 1994  
USEPA Bronze Medal re Drinking Water Regulations, 1997

#### ADDITIONAL ACTIVITIES:

Pharmacy license in Virginia and New York.

Served as member of Microbiology Panel at the "Protocol Development: Criteria and Standards for Potable Reuse and Feasible Alternatives" Workshop, ODW, Airlie House, Virginia, July 1980.

Served as member and rapporteur to the World Health Organization Biological Aspects Task Group on Drinking Water Guidelines, 1980-81.

Served as consultant to the Pan-American Health Organization on environmental virus methods at CETESB, Sao Paulo, Brazil, Aug. 1980.

Program Advisory Committee member/chairman, Ecology and Control Section for 2nd International Symposium on Legionella, Atlanta, GA, June 1983.

Served as presenter and co-rapporteur of Occupational Hazards Panel at the Commission of European Communities Workshop on "Epidemiological Studies of Risks Associated with the Agricultural Use of Sewage Sludge: Knowledge and Needs," Metz, France, May, 1985.

Member of the work group on development of the coliform and surface water filtration regulations, ODW, EPA, 1986-1989.

Lead author of Giardia section for revision of the World Health Organization International Drinking Water Guidelines, 1989-1995.

Member, Task Group for revision of the World Health Organization International Drinking Water Guidelines, 1989-1995.

Serve as a reviewer for manuscripts submitted to Journal of American Water Works Association, Journal of Infectious Disease, American Journal of Tropical Medicine and Hygiene, Western Journal of Medicine and Journal of the American Public Health Association, Applied and Environmental Microbiology, et al., continuing basis.

Member, OGWDW Work Group for development of ICR, ESWTR and D/DBP rules, 1993-1997.

Peer reviewer for the NYC Expert Panel on Water Supply, 1992-1993.

Member, NYC Advisory Panel on Waterborne Disease Assessment, 1993.

Organizer and participant, Protozoa, Virus and Coliphage Monitoring Workshop, Office of Water, Cincinnati, OH, 1993.

Participant, Microbial and Disinfection By-Product Research Needs Expert Workshop, AWWA Association Research Foundation, Miami, FL, 1993.

Presenter/participant, Milwaukee Boil Water Workshop, June 1994.

Presenter, participant and co-chair of environmental methods group, Centers for Disease Control and Prevention workshop on "Assessing the Public Health Threat Associated with Waterborne Cryptosporidiosis," Atlanta, GA, September 22-23, 1994.

Project Advisory Committee member, AWWARF Project #162, "Innovative and Rapid Methods for *Giardia/Cryptosporidium*," 1995-1999.

Presenter and participant, AWWA workshop on government *Cryptosporidium* research, Beltsville, MD, September 6, 1995.

Developer, steering committee member, presenter and participant at EPA workshop on Development of *Giardia/Cryptosporidium* Protocols, Crystal City, VA, September 11-12, 1995.

Member, Work Group on Bacteria/Disinfection Requirements, ORSANCO, 3/96

Participant, Expert Workshop on Waterborne Cryptosporidiosis in the Immunocompromised Population, AWWARF, Atlanta, GA, June, 1996.

Participant, FDA Workshop on *Cyclospora* Methods, Washington, DC, 8/96

Member, CDC Working Group on Waterborne Cryptosporidiosis and presenter at international teleconference on the Public Health Handbook, May, 1997

WERF Project Subcommittee Member for 98-HHE-2, "Fate and Persistence of Pathogens Subjected to Disinfection", 1997-

Invited participant, AOAC symposium on waterborne protozoa, Montreal, September 1998.

WERF Health Advisory Committee Member for 98-REM-1, "A Dynamic Model to Assess Microbial Health Risk Associated with Beneficial Uses of Biosolids", 1999-2002.

WERF Project Subcommittee Member for 00-PUM-3, "Microbial Risk Assessment Techniques and Applications for Nonpotable Uses of Reclaimed Wastewater 1999-2003.

Invited reviewer for "Water and Foodborne Diseases" section of report to Congress entitled "U.S. National Assessment on the Potential Consequences of Climate Variability and Change", October, 1999.

Faculty member, 1999 AWWA-WQTC Workshop "Detection and Quantitation of Infectious *Cryptosporidium*", Tampa, Florida, October, 1999.

Invited presenter and co-chair of "Water Treatment" session at "*Giardia* in the Rockies" conference, Canmore, Alberta, Canada, October, 2000.

Faculty member, 2000 AWWA-WQTC Workshop "Measuring Disinfection of *Cryptosporidium*: Cell Culture and Other In-Vitro Methods", Salt Lake City, Utah, November, 2000.

WERF Health Advisory Committee Member for 98-REM-1A, "A Dynamic Model to Assess Microbial Health Risk Associated with Beneficial Uses of Biosolids--Phase 2", 2003-2006.

Invited presenter, 4<sup>th</sup> International *Giardia* Conference and First Combined *Giardia/Cryptosporidium* Meeting, September 20-24, 2004, Amsterdam, The Netherlands.

WERF Project Subcommittee Member for 03-HHE-2, "Developing Better Indicators for Pathogen Presence in Waste Matrices", 2004-2007.

WaterReuse Foundation Project Advisory Committee Member for M-04-01, "Application of Microbial Risk Assessment Techniques to Estimate Risk Due to Exposure to Reclaimed

Waters”, 2005-2007.

WateReuse Foundation Project Advisory Committee Member for WRF-06-003, “Investigating the Occurrence of Infectious *Cryptosporidium* Oocysts in Recycled Water and Evaluating the Effectiveness of Various Disinfection Techniques”, 2006-2009.

Panel Member, EPA CCL Microbial Expert Focused Workshop: Phase II, Arlington, VA, June, 2006

Advisory Panel Member for the NWRI-Orange County Water District Independent Advisory Panel for the Groundwater Replenishment System, 2007-2013.

Liaison to the NWRI Independent Advisory Panel on the Orange County Waste District’s Santa Ana River Monitoring Panel.

Member of the 2012 NWRI Independent Advisory Panel for WateReuse Foundation Project 11-02 on criteria for direct potable reuse.

#### SELECTED JOURNAL ARTICLES:

Jakubowski, W., S.L. Chang, T.H. Ericksen, E.C. Lippy and E.W. Akin. 1978. Large-volume sampling of water supplies for microorganisms. *JAWWA*, 70:702-706.

Dykes, A.C., D. Juranek, R. Lorenz, S. Sinclair, W. Jakubowski and R. Davies. 1980. Municipal waterborne giardiasis: an epidemiologic investigation. *Ann. Int. Med.*, 92(Part 1):165-170.

Pahren, H.R. and W. Jakubowski. 1981. Health aspects of wastewater aerosols. *Water Sci. Technol.*, 13:1091-1096.

Harter, L., F. Frost and W. Jakubowski. 1982. *Giardia* prevalence among 1 to 3 year old children in 2 Washington State counties. *Am. J. Pub. Hlth.*, 72:386-388.

Dufour, A.P. and W. Jakubowski, 1982. Drinking water and legionnaires' disease. *JAWWA*, 74:631-637.

Holman, B., F. Frost, B. Plan, K. Fukutaki and W. Jakubowski. 1983. Recovery of *Giardia* cysts from water: centrifugation vs. filtration. *Water Res.*, 17:1705-1707.

Fannin, K.F., S.C. Vana and W. Jakubowski. 1985. Effect of an activated sludge wastewater treatment plant on ambient air densities of aerosols containing bacteria and viruses. *AEM*, 49:1191-1196.

Akin, E.W. and W. Jakubowski. 1986. Drinking water transmission of giardiasis in the United States. *Water Sci. Technol.*, 18:219-226.



Jakubowski, W. 1988. Purple burps and the filtration of drinking water supplies. Am. J. Pub. Hlth., 78:123-125.

Goldstein, N., W.A. Yanko, J.M. Walker and W. Jakubowski. 1988. Determining pathogen levels in sludge products. Biocycle, 29:44-47, 67.

Erlandsen, S.L., L.A. Sherlock, M. Januschka, D.G. Schupp, F.W. Schaefer, III, W. Jakubowski and W.J. Bemrick. 1988. Cross-species transmission of *Giardia*: Inoculation of beavers and muskrats with cysts of human, beaver, mouse and muskrat origin. AEM, 54:2777-2785.

Ward, R.L., D.R. Knowlton, J. Stober, W. Jakubowski, T. Mills, P. Graham and D.E. Camann. 1988. Effect of wastewater spray irrigation on rotavirus infection rates in an exposed population. Water Res., 23(12):1503-1509.

Erlandsen, S.L., L.A. Sherlock, W.J. Bemrick, H. Ghobrial and W. Jakubowski. 1990. Prevalence of *Giardia* in beaver and muskrat populations in New England states and Minnesota: detection of intestinal trophozoites at necropsy provides greater sensitivity than detection of cysts in fecal samples. AEM, 56:31-36.

Casson, L.W., C.A. Sorber, J.L. Sykora, P.D. Gavaghan, M.A. Shapiro and W. Jakubowski. *Giardia* in wastewater--effect of treatment. 1990. Res. J. Water Poll. Control Fed., 62(5):670-675.

Jakubowski, W., J.L. Sykora, C.A. Sorber, L.W. Casson and P.D. Gavaghan. 1991. Determining giardiasis prevalence by examination of sewage. Water Sci. Technol., 24:173-178.

Sykora, J.L., C.A. Sorber, W. Jakubowski, L.W. Casson, P.D. Gavaghan, M.A. Shapiro and M.J. Schott. Distribution of *Giardia* cysts in wastewater. 1991. Water Sci. Technol., 24:187-192.

Rose, J.B., C.P. Gerba and W. Jakubowski. 1991. Survey of potable water supplies for *Cryptosporidium* and *Giardia*. Environ. Sci. and Technol., 25(8):1393-1400.

Erlandsen, S.L., W.J. Bemrick and W. Jakubowski. 1991. Cross-species transmission of avian and mammalian *Giardia* spp.: inoculation of chicks, ducklings, budgerigars, Mongolian gerbils, and neo-natal mice with *Giardia ardeae*, *Giardia duodenalis* (lamblia), *Giardia psittaci*, and *Giardia muris*. International J. Environ. Hlth. Res., 1(3):144-152.

Erlandsen, S.L., A.R. Weisbrod, L. Knutson, R. Olereich, W.E. Dodge, W.J. Bemrick and W. Jakubowski. 1991. Giardiasis in wild and captive bird populations; high prevalence in herons and budgerigars. International J. Environ. Hlth. Res., 1(3):132-143.

Sauch, J.F., D. Flanigan, M.L. Galvin, D. Berman and W. Jakubowski. 1991. Propidium iodide as an indicator of *Giardia* cyst viability. AEM, 57(11):3243-3247.

Mahbubani, M.H., A.K. Bej, M. Perlin, F.W. Schaefer, III, W. Jakubowski and R.M. Atlas. 1991. Detection of *Giardia* using the polymerase chain reaction and distinguishing live from dead cysts. *AEM*, 57(12):3456-3461.

Mahbubani, M.H., A.K. Bej, M. Perlin, F.W. Schaefer, III, W. Jakubowski and R.M. Atlas. 1992. The differentiation of *Giardia duodenalis* from other *Giardia* spp. based on the polymerase reaction and gene probes. *J. Clin. Microbiol.*, 30(1):74-78.

Rodgers, M.R., C.M. Bernardino and W. Jakubowski. 1993. A comparison of methods for extracting amplifiable *Giardia* DNA from various environmental samples. *Water Science Technology*, 27(3-4):85-88.

Gavaghan, P.D., J. L. Sykora, W. Jakubowski, C. A. Sorber, A. M. Sninsky, M. D. Lichte and G. Kelti. 1993. Inactivation of *Giardia* by anaerobic digestion of sewage sludge. *Water Science Technology*, 27 (3-4): 111-114.

Stadterman, K.L., A.M. Sninsky, J.L. Sykora and W. Jakubowski. 1995. Removal and inactivation of *Cryptosporidium* oocysts by activated sludge treatment and anaerobic digestion. *Wat. Sci. Tech.*, 31(5-6):97-104.

DuPont, H.L., C.L. Chappell, C.R. Sterling, P.C. Okhuysen, J.B. Rose and W. Jakubowski. 1995. The infectivity of *Cryptosporidium parvum* in healthy volunteers. *New England Journal of Medicine*, 332:855-859.

Rodgers, M.R., D.J. Flanigan and W. Jakubowski. 1995. Identification of algae which interfere with the detection of *Giardia* cysts and *Cryptosporidium* oocysts and a method for alleviating this interference. *AEM*, 61(10):3759-3763.

Jakubowski, W., S. Boutros, W. Faber, R. Fayer, W. Ghiorse, M. LeChevallier, J. Rose, S. Schaub, A. Singh and M. Stewart. 1996. Environmental methods for *Cryptosporidium*. *JAWWA*, 88(9):107-121.

Slifko, T.R., D.E. Friedman, J.B. Rose, S.J. Upton and W. Jakubowski. 1997. Unique cultural methods used to detect viable *Cryptosporidium parvum* oocysts in environmental samples. *Water Science Technology*, 35(11):363-368.

Slifko, T.R., D.E. Friedman, J.B. Rose and W. Jakubowski. 1997. An in Vitro method for detecting infectious *Cryptosporidium* oocysts with cell culture. *AEM*, 63(9):3669-3675.

Rodman, J.S., F. Frost, L. Davis-Burchat, D. Fraser, J. Langer and W. Jakubowski. 1997. Pharmaceutical sales—a method of disease surveillance? *Jour. Environ. Health*, 60(4):8-14.

Okhuysen, P.C., C.L. Chappell, C.R. Sterling, W. Jakubowski and H.L. DuPont. 1998. Susceptibility and serologic response of healthy adults to reinfection with

*Cryptosporidium parvum*. Infect. & Immun.,66(2):441-443.

Rodman, J.S., F. Frost and W. Jakubowski. 1998. Using nurses' hotline calls for disease surveillance. Emerging Infect. Dis. 4(2):329-332.

Chappell, C.L., P.C. Okhuysen, C.R. Sterling, C. Wang, W. Jakubowski and H.L. DuPont. 1999. Infectivity of *Cryptosporidium parvum* in healthy Adults with pre-existing anti-*C. parvum* Serum IgG. Am. J. Trop. Med. Hyg. 60(5):157-164.

Slifko, T.R., D.E. Huffman, B. Dussert, J.H. Owens, W. Jakubowski, Haas, C.N. and J.B. Rose. 2002. Correlation of cell culture and animal infectivity for *Cryptosporidium parvum* Genotype 2 (Ames, Iowa Isolate). Experimental Parasitology 101/2-3:97-106(Nov.2002; Pub. On-line 9/19/02).

J.E. Smith, Jr., P.D. Millner, W. Jakubowski, N. Goldstein and R. Rynk. Contemporary Perspectives on Infectious Disease Agents in Sewage Sludge and Manure. 2005. Compost Science & Utilization, The JG Press, Inc., Emmaus, PA.

Baque RH, Gilliam AO, Robles LD, Jakubowski W, Slifko TR. A real-time RT-PCR method to detect viable *Giardia lamblia* cysts in environmental waters. Water Res. 2011 May;45(10):3175-84. Epub 2011 Mar 23

**Walter Jakubowski**

*Consultant*

*WaltJay Consulting (Spokane, Washington)*

Education includes an M.S. in Microbiology from Oregon State University after graduating cum laude in Pharmacy from Brooklyn College of Pharmacy, Long Island University. He has certificated graduate training in Epidemiology from the University of Minnesota. He has been a hospital pharmacist and has research publications in this field. He conducted research on microorganisms in oysters and clams under the federal Shellfish Sanitation Program; however, most of his career has revolved around determining the health effects and public health significance of pathogens, especially intestinal protozoa and viruses, in drinking water, waste water and municipal sewage sludge. He has authored or co-authored more than 40 peer-reviewed publications in this area. He has served as a consultant to the World Health Organization on pathogenic intestinal protozoa (for development of the International Drinking Water Guidelines), and to the Pan-American Health Organization on environmental virus methods. He helped the Centers for Disease Control conduct the first international symposium on *Legionella* and Legionnaire's Disease.

With more than 49 years experience working with waterborne pathogens, he is a recognized international expert on *Giardia* and giardiasis and has given invited presentations on this organism at domestic and international conferences. In addition to developing and standardizing methods for the detection of intestinal protozoa and viruses in the environment, he initiated research designed to gather information on the occurrence and distribution of *Giardia* infection in wildlife. He developed the first practical method for detecting *Giardia* cysts in drinking waters and he was the first to recover cysts, using this method, from source waters and distribution system water from a public water supply involved in a waterborne outbreak. He has worked with a variety of international, national, state and local public health authorities on problems related to *Giardia* and other infectious organisms in water, wastewater and sludge.

He initiated landmark studies on the human infectious dose of *Cryptosporidium* oocysts. He chaired the Joint Task Group on Pathogenic Intestinal Protozoa for *Standard Methods for the Examination of Water and Waste Water* from 1978 to 2005. He was a charter member of USEPA's Pathogen Equivalency Committee and served on that committee until his retirement from the U.S. Public Health Service/Environmental Protection Agency in 1997. In 2006, he participated in an expert panel on procedures for improving the EPA mechanism for selecting microorganisms for the Drinking Water Contaminant Candidate List. He served on the National Water Resources Institute (NWRI) Independent Advisory Panel (IAP) for the Orange County (California) Water District's Groundwater Replenishment System from 2007 until 2013 and was also a liaison to the NWRI IAP on the Orange County Waste District's Santa Ana River Monitoring Panel. He served as a microbiologist and public health expert on the 2012 NWRI IAP for WaterReuse Foundation Project 11-02 on criteria for direct potable reuse. He participated in a recently completed multi-organization research project to develop a molecular method for detecting and enumerating viable/infectious *Giardia* cysts of public health importance in environmental samples. His current interests include microbiological risk assessment and issues concerning waterborne pathogens in drinking water, wastewaters and reclaimed wastewater. He recently served as an advisor to Washington State in developing microbiological standards for the use of reclaimed wastewater. He was an invited participant in the 2010 WaterReuse Foundation expert panel on "*Examination of Microbiological Methods for Use with Reclaimed Waters.*" He is on the editorial board for the International Journal of Environmental Health Research.