

BIOGRAPHICAL SKETCH

NAME: Barbara D. Abbott

POSITION TITLE: Principal Investigator

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Northeastern Illinois University, Chicago, IL	BS	1979	Biology and Chemistry
North Carolina State University, Raleigh, NC	MS	1982	Toxicology
North Carolina State University, Raleigh, NC	PhD	1985	Toxicology

PROFESSIONAL EXPERIENCE

April 1990 – present Research Biologist GS14, Reproductive Toxicology Division, Health Effects Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711

1987-1990 -- IRTA Postdoctoral Fellow, Systemic Toxicology Branch, Chemical Disposition Lab., National Institute of Environmental Health Sciences, Research Triangle Park, NC.

1985-1997 --NRSA Postdoctoral Fellow, Laboratory of Reproductive and Developmental Toxicology, National Institutes of Environmental Health Sciences, Research Triangle Park, NC.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Teratology Society

Society of Toxicology

N.C. Branch of the Society of Toxicology

Editorial Board, *Toxicological Sciences*, January 1, 2006-on-going appointment.

Editorial Board, *Reproductive Toxicology*, April 2005-on-going appointment

SELECTED AWARDS AND HONORS

2005 NHEERL Diversity Award, Team Award.

2004 Scientific and Technological Achievement Award (Level III), US Environmental Protection Agency.

1999 Scientific and Technological Achievement Award (Level II), US Environmental Protection Agency.

1994 Scientific and Technological Achievement Award (Level III), US Environmental Protection Agency.

1992 Scientific and Technological Achievement Award (Level III), US Environmental Protection Agency.

1991 Scientific and Technological Achievement Award (Level III), US Environmental Protection Agency.

INVITED LECTURES/SYMPOSIA 2000-2006

International Meetings and Societies:

Symposia presented at the meeting “Assessment of the Risk to the Progeny by Complex Environmental Chemicals”, February 21-22, 2003, Tokyo, Japan, hosted by Dr. Jun Sekizawa and the Japanese National Institute of Health and the Japanese Ministry of the Environment. Symposia presentations “The Role of the Epidermal Growth Factor Receptor Pathway in Response to Dioxin” and “Receptor-mediated Pathways regulating the Response to Dioxin: Insights from Transgenic Mouse Models”.

Symposium presentation “Angiogenesis gene downregulation in placentae of ARNT-deficient embryos”, at the July 12-17, 2000 International Federation of Teratology Societies Satellite Symposium, Hiroshima, Japan, “Reproductive and Developmental Effects of Dioxins and Endocrine Disrupters”.

National and Regional Professional Meetings:

Teratology Society Continuing Education Course, Signaling Pathways and Tissue Interactions in Organ-System Development, “Morphogenesis and Differentiation”, June 2004, Vancouver, British Columbia.

Organized and Chaired “The National Children’s Study: Progress developing methods appropriated for assessing children’s exposure, biomarkers, and genetic susceptibility” a workshop presented at the Annual meeting of the Society of Toxicology, 2004.

Gordon Research Conference, Mechanisms of Toxicity, Session Chair, August 2000.

Teratology Society Continuing Education Course, Lecturer, "Vasculogenesis and Angiogenesis: A critical gene pathway for embryonic development." Annual meeting of the Teratology Society, June, 2000.

Wiley-Liss Symposium, "Vasculogenesis and Angiogenesis: Responses to teratogenic agents." Teratology Society meeting, June, 2000.

Society of Toxicology, Continuing Education Course Instructor, "Immunohistochemical methods for localizing the expression of proteins in tissues and cells," March, 2000.

University of Wisconsin-Madison, Madison, WI, seminar presented at the "Horizons in Developmental and Molecular Toxicology: Dioxins and PCBs: Assessing Health and Environmental Effects" meeting. Seminar title: "Responses of mouse and human palatal shelves to TCDD", June 1-2, 2000.

Vertebrate Development and Teratology Course, University of North Carolina, Chapel Hill, NC. "Angiogenesis", February 3, 2005.

Environmental Toxicology Course, Duke University, Durham, NC. "Principals of Teratology & Mechanistic Research in Developmental Toxicology", April 17, 2003.

Developmental Toxicology & Teratology Course, University of North Carolina at Chapel Hill, NC. "The receptor pathway regulating responses to dioxin: Links with signal transduction and vasculogenesis", March 18, 2003.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY 2000-2006

President, North Carolina Chapter of the Society of Toxicology (NCSOT), 2002-2003

Councilor, Reproductive Toxicology Specialty Section, Society of Toxicology, 2002-2004.

Genomics, Proteomics and Bioinformatics Committee, Teratology Society, 2003- 2004.

Publications Committee, Teratology Society, 2001-2004, Chair (2002-2003)

Risk Assessment Task Force, Society of Toxicology, 1999-2002.

Teratology Society Education Committee, 1998 to 2000.

Peer Review:

Research Development and Enhancement Award, Texas A&M University System Health Science Center, College Station, TX, June 2004.

Research Training Fellowship from The Wellcome Trust Limited, London, England, June 2004.

Final Study Report for National Toxicology Program, "Developmental toxicity evaluation for silver acetate administered by gavage to Sprague-Dawley (CD) rats on gestational days 6 through 19", May 2002.

Ad Hoc reviewer for the following journals (reviewer for 48 submissions from 2002-2005): Birth Defects Research, Carcinogenesis, Cleft Palate Journal, Human Genetics, Human Molecular Reproduction, Journal of Biochemical and Molecular Toxicology, Journal of Histochemistry and Cytochemistry, Life Sciences, Regulatory Toxicological Pharmacology, Reproductive Toxicology, Toxicological Sciences, Toxicology and Applied Pharmacology

Research Advisor Post Doctoral Fellows, Graduate and Undergraduate students:

Dr. Margy Wintermeyer, US EPA NHEERL Post-doctoral Fellow, June 2004 to present.

Dr. Louise Parks, US EPA NHEERL Post-doctoral Fellow, 1998-2000.

Hadiya Boyd, NCCU, Minorities Access to Research Careers (MARC), undergraduate candidate for Bachelor of Science degree, 2003-2004.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY 2000-2006

Risk Assessment Forum (RAF) Project on PPAR α -mediated Hepatocarcinogenesis in Rodents and Relevance for Human Health Risk Assessments; serve as a member of the RAF PPAR Committee at the request of the RAF Subcommittee on Health Effects. August, 2005-on-going.

NHEERL Technical Qualifications Board, appointment from April 2004-2007.

Appointed by EPA Genomics Task Force Steering Committee to serve on Genomics Task Force-Training Workgroup, July 2004- On-going appointment.

Reproductive Toxicology Division Team Leader for Cell Signaling Effects Team, (Acting) September 2004 to January 2005.

NHEERL-RTP Quality Assurance Workgroup, Principal Investigator member for RTD, August 2002-August 2005.

Served on the NHEERL Focus Group for Guidance for Publication Authorship and Acknowledgment, 2005.
Program Project Co-Chair, organize and implement NHEERL Human Health Research Program Project;
Harmonization of Cancer and Non-Cancer Risk Assessment: Disruption of Mitogen Activated Protein Kinase (MAPK) Signaling as a Common Mode of Action for Environmental Toxicants. November 2001-August 2004:
Member of Reproductive Toxicology Facility (RTF) Animal Facility Committee (AFC) charged with developing a Standard Operating Procedure for RTF, April 2004.
Reproductive Toxicology Division, Research Theme Leader for “Receptor-mediated mechanisms of Developmental Toxicity”, 1994 to 2002.
RTD Workforce Utilization Taskforce, committee member, 2003.
NHEERL Synergy Workgroup Committee, April, 1998-January 2001
NHEERL Implementation Plan Steering Committee for Safe Communities GPRA Goal 4, 2000.

PUBLICATIONS

(Publications represent 12 out of a total of 21 for the period 2000-2006)

1. Hurst, Christopher, Abbott, Barbara, and Linda Birnbaum. 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) disrupts early morphogenetic events that form the lower reproductive tract in female rat fetuses. *Toxicol. Sci.* 65:87-98, 2002.
2. Abbott, Barbara D., Buckalew, Angela R., DeVito, Michael J., Ross, David, Bryant, P. LaMont, and Schmid, Judith E. EGF and TGF β expression influence the developmental toxicity of TCDD: Dose response and AHR phenotype in EGF, TGF β and EGF+TGF β knockout mice. *Toxicol.Sci.*71:84-95, 2003.
3. Rogers, John M. and Barbara D. Abbott. Toxicological Highlight: In Vitro Screening for Developmental Toxicity of Tobacco Smoke Constituents. *Toxicological Sciences*, 75: 227-228, 2003.
4. Abbott, Barbara D., Tien-Min Lin, Nathan T. Rasmussen, Robert W. Moore, Ralph M. Albrecht, Judith E. Schmid and Richard E. Peterson. Lack of Expression of EGF and TGF β in the Fetal Mouse Alters Formation of Prostatic Epithelial Buds and influences the response to TCDD. *Toxicological Sciences*, 76:427-436, 2003.
5. Goldman, Jerome M., Ashley S. Murr, Angela R. Buckalew, Judith E. Schmid and Barbara D. Abbott. Methoxychlor-induced Alterations in the Histological Expression of Angiogenic Factors in Pituitary and Uterus. *Journal of Molecular Histology*, 35:363-375, 2004.
6. Abbott, Barbara D., Best, Deborah S. and Michael G. Narotsky. Teratogenic effects of retinoic acid are modulated in mice lacking expression of epidermal growth factor (EGF) and transforming growth factor-alpha (TGF β). *Birth Defects Research: Part A*, 73 (4):204-217, 2005.
7. Abbott, B.D., A.R. Buckalew and K.E. Leffler. Effects of EGF, TGF β and TCDD on fusion of embryonic palates in serum-free organ culture using wild type, EGF knockout and TGF knockout mouse strains. *Birth Defects Research: Part A*, 73 (6):447-454, 2005.
8. Held, Gary and Barbara Abbott: Chapter 22: Palatal Dysmorphogenesis: Quantitative RT-PCR. In: *Methods in Molecular Biology*, Vol. 136: Developmental Biology Protocols, Volume II, eds. R. S. Tuan and C. W. Lo, Humana Press Inc., Totowa, NJ, pp203-217, 2000.
9. Abbott, B. D. Insights from AhR and ARNT gene knockout studies regarding responses to TCDD and regulation of normal embryonic development. *Congenital Anomalies Supplement* 40:s88-s93, 2000.
10. Abbott, Barbara D. Experimental Models for the Study of Oral Clefts. In: *Cleft Lip and Palate. From Origin to Treatment*, Diego F. Wyszynski (Editor), Oxford University Press, New York. Chapter 15, pp193-202, 2002.
11. Abbott, Barbara D. Organ culture of mid-facial tissue & secondary palate. In: *Current Protocols in Toxicology*, (M.D. Maines, L.G. Costa, E. Hodgson, and D.J. Reed, eds.), Supplement 16, Chapter 13, Unit 6, pp13.6.1-13.6.11. John Wiley & Sons, Inc, New York, 2003.
12. Abbott, Barbara D., Rosen, Mitchell B., and Held, Gary Cellular, Biochemical and Molecular techniques in developmental toxicology. In: *Developmental and Reproductive Toxicology, a Practical Approach*. Ron Hood (Editor), Chapter 14: pp599-620, CRC Press, Inc, Boca Raton, FL, 2006.

NARRATIVE

I pursue research into the mechanisms of developmental toxicity with particular emphasis on complex, interactive signal transduction and receptor-mediated pathways. Pathways under investigation include the EGFR pathway of mitogen activated phospho-kinase (MAPK) mediated signaling and PPAR transcriptional regulation. Signaling through these pathways is affected by toxicant exposures and linked with induction of birth defects as well as adverse effects on postnatal survival and growth. The goal of the research is to identify essential elements in response pathways that have the potential to occur across species and thus to provide a sound scientific basis for interspecies extrapolation and extend the mechanistic approach to evaluation of potential human responsiveness and concerns about increased risk for sensitive population groups (such as prenatal, neonatal, child health issues).

BIOGRAPHICAL SKETCH

NAME: Sidney W. Abel III

POSITION TITLE: Associate Director

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Maryland, College Park	BS	1980	Environmental Science/Chemistry
George Washington University	MS	1985	Environmental Chemistry

PROFESSIONAL EXPERIENCE

- 2005 – Present Associate Director
United States Environmental Protection Agency, Office of Pesticides Programs (OPP),
Environmental Fate and Effects Division (EFED), Washington, DC
- 2002 – 2005 Branch Chief, Environmental Risk Branch I
United States Environmental Protection Agency, Office of Pesticides Programs (OPP),
Environmental Fate and Effects Division (EFED), Washington, DC
- 1998 – 2002 Senior Environmental Scientist
United States Environmental Protection Agency, Office of Pesticides Programs (OPP),
Environmental Fate and Effects Division (EFED), Washington, DC
- 1997 – 1998 Environmental Scientist
United States Environmental Protection Agency, Office of Pesticides Programs (OPP),
Environmental Fate and Effects Division (EFED), Washington, DC
- 1989 – 1997 Environmental Scientist
United States Environmental Protection Agency, Office of Pollution Prevention and Toxics,
Economics, Exposure and Technology Division (EETD), Washington, DC
- 1984 – 1989 Environmental Sanitarian
Maryland Department of the Environment, Bureau of Environmental Health, Howard County,
Maryland

INVITED LECTURES/SYMPOSIA

- Nguyen, M-T.L., S.W. Abel, A. Al-Mudallal, J.A. Hetrick, and J.L. Ellis. 2004. Incorporation of Water Treatment Effects on Pesticide Removal and Transformations in Drinking Water Assessments-USEPA/OPP's Interim Science Policy. AWWA and International Water Association Meetings. Prague, Czech Republic.
- Jones, R. David, Sidney Abel, William Effland, Robert Matzner, and Ronald Parker. 1998. An Index Reservoir for Use in Assessing Drinking Water Exposure. *Chapter IV in Proposed Methods for Basic-Scale Estimation of Pesticide Concentration in Flowing Waters and Reservoirs for Tolerance Reassessment*. Presented to the FIFRA Scientific Advisory Panel, July 29-30, 1998. <http://www.epa.gov/scipoly/sap/1998/index.htm>
- Abel, S.A. 1992. *Screening Level Approach for Environmental Exposure Assessments Under the Toxic Substances Control Act (TSCA)*. Proceeding of the Society of Environmental Toxicology and Chemistry, November, 1992.

PUBLICATIONS

Powell, D.E., R.B. Annelin, R.H. Gallavan, Special Acknowledgment, S.W. Abel. 1999. *Silicone in the Environment: A Worst-Case Assessment of Poly(dimethylsioxane) (PDMS) in Sediments*. Environmental Science and Technology; 1999; 33(21); 3706-3710.

Abel, S.W., R.L. Margosian, L.G. Schweer, M.D. Koontz. 1995. *Determining Formaldehyde Concentrations from Engineered Wood Products in a Newly Constructed House Using an IAQ Test House Approach*. Indoor Environments, April 1995.

Produced several manuals for various models developed on behalf of the USEPA:

1. ReachScan User's Guide
2. Select Industrial Discharge System, User's Guide
3. Select Industrial Discharge System, Background Documentation
4. Probabilistic Dilution Model 3, User's Guide
5. Probabilistic Dilution Model 3, Volume 1: Background Documentation and Theory
6. Probabilistic Dilution Model 3, Volume 2: Programming Documentation

BIOGRAPHICAL SKETCH

NAME: Carolyn Acheson

POSITION TITLE: Chemical Engineer

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Delaware	B.Ch.E.	1987	Chemical Engineering, minor biology
Cornell University	Ph.D.	1995	Chemical Engineering, minor microbiology

PROFESSIONAL EXPERIENCE

1994 to present U.S. Environmental Protection Agency, Cincinnati, Ohio
Chemical Engineer

1995 – 1997 University of Cincinnati, Cincinnati, Ohio, Adjunct Assistant Professor

1987 to 1994 Cornell University, Ithaca, New York, Research Assistant

1987, summer E. I. duPont de Nemours and Company, Glasgow, Delaware
Summer Engineer

1984 – 1987 University of Delaware, Newark, Delaware
Undergraduate Research Assistant

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Institute of Chemical Engineers

SELECTED AWARDS AND HONORS

2006 US EPA Bronze Medal for Commendable Service (from OPPTS)

2000 US EPA Scientific and Technological Achievement Award for G.D. Sayles, et al., 1999. Environmental Science and Technology, **33**:4310 - 4 317. (from ORD)

INVITED LECTURES/SYMPOSIA

C. Acheson, R.Herrmann, L. Zintek, R.Brenner, T. Dahling, E. Foote, M. Graves, J.L.Heckman, S. Stoll, T. Strock, J. Tompkins, S. VonderHaar, and S. Wright. "Monitoring Microbes, Alkyl Phenols, and Soil Toxicity after Land Application of Anaerobically Digested Biosolids", at the WEF Residuals and Biosolids Management Conference, Covington, KY, March 2006.

C.M. Acheson, M.C. Brinkman, and G.D. Sayles. "Using Bioassays to Evaluate the Performance of Risk Management Techniques," Effective Risk Management of Endocrine Disrupting Chemicals Workshop, Cincinnati, OH. January 2002.

C.M. Acheson, R.C. Brenner, G.D. Sayles, J.A. Glaser, P.T. McCauley, C.L. Potter, and R.F. Herrmann. "Evaluating the Performance of Four Bioremediation Technologies Using Chemistry and Toxicity," Innovative Clean-up Approaches: Investments in Technology Development, Results and Outlook for the Future, Bloomingdale, IL. November 1999.

M. Harkness, A. Fisher, R. Royer, A. Possolo, M. Lee, E.E. Mack, J.A. Payne, D. Major, S. Dworatzek, J. Roberts, C. Acheson, R. Herrmann, X. Mao. "SABRE Multi-lab, Statistically-based Microcosm Study for TCE Source Zone Remediation", Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA. May 2006.

S. Dworatzek, J. Roberts, R. Herrmann, T. Dahling, C. Acheson, D. Major, M. Harkness, A. Fisher, R. Royer, M. Lee, E.E. Mack, J.A. Payne. "Characterizing the Microbial Community in SABRE Laboratory Studies", Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA. May 2006.

C. Acheson, N. Sellers, M. Harkness, A. Possolo, A. Fisher, R. Royer, S. Dworatzek, J. Roberts, M. Lee, E.E. Mack, J.A. Payne, D. Major. "Metrics of Performance for the SABRE Microcosm Study (poster)", Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA. May 2006.

C.M. Acheson. "Using Bioassays to Evaluate the Performance of EDC Risk Management Techniques," American Institute of Chemical Engineers Annual Meeting, San Francisco, CA. November 2003.

C.M. Acheson, G.D. Sayles, R.F. Herrmann, T. Richardson, T. Dahling, Y. Shan, D.A. Balz, M.J. Kupferle, J.L. Mansfield, D. Macke, A. Koeniger, and V.A. Lancaster. "Land Treatment of Two Plateau Materials Contaminated with PAHs," In Situ and On-Site Bioremediation International Symposium, Orlando, FL. April 2003.

Y. Shan, M.J. Kupferle, S. Qi, D.A. Balz, M. Hardebeck, C.M. Acheson, and A. Vega. "Field Scale Studies: How Does Soil Sample Pretreatment Affect Representativeness?" In Situ and On-Site Bioremediation International Symposium, Orlando, FL. April 2003.

C.M. Acheson, V.S. Magar, S.J. Naber, R.D. Lizotte, L. Wang, V.S. Steed. Physiologically Based Extraction Procedure: Comparison of Five Simulated Stomach Fluids," In Situ and On-Site Bioremediation International Symposium, San Diego, CA. June 2001.

C.M. Acheson, J.L. Mansfield, A.P. Khodadoust, Y. Shan, M.J. Kupferle, and R.C. Brenner. "Using Toxicity Bioassays to Evaluate a Soil Washing Process," Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA. May 2000.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

2001 to present RTDF - Bioremediation Consortium Co-Chair

The Remediation Technology Development Forum (RTDF) - Bioremediation Consortium is a cooperative effort between EPA, industry, and academia to accelerate the development of cost-effective in situ bioremediation technologies for chlorinated solvents. Since its inception in 1993, 6 field demonstrations have been performed to evaluate technologies. In 2004, the group expanded to include several partners from United Kingdom (UK) and initiated a study to evaluate bioremediation in areas of high concentration such as source areas (through a UK grant).

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Current research is primarily in the following areas: fate and transformation of endocrine disrupting chemicals particularly following land application of biosolids; fluorotelomer fate and transformation in sewage treatment; bioremediation of chlorinated solvents; bioremediation of sediments contaminated with polycyclic aromatic hydrocarbons, technical support for bioremediation technologies; and soil ecotoxicity.

PUBLICATIONS

C.M. Acheson, Q. Zhou, Y. Shan, G.D. Sayles, and M.J. Kupferle, 2004. "Comparing the Solid Phase and Extract Microtox Assays for Two PAH Contaminated Soils," Environmental Toxicology and Chemistry **23**: 245-251.

G.D. Sayles, C.M. Acheson, M.J. Kupferle, Y. Shan, Q. Zhou, J.R. Meier, L. Chang, and R.C. Brenner, 1999. "Land Treatment of PAH-Contaminated Soil: Performance by Chemical and Toxicity Assays," Environmental Science and Technology, **33**:4310 - 4 317.

A.P. Khodadoust, M.T. Suidan, C.M. Acheson, and R.C. Brenner, 1999. "Remediation of Soils Contaminated with Wood Preserving Wastes: Crosscurrent and Countercurrent Solvent Washing," Journal of Hazardous Materials, **64**: 167 - 179.

A.P. Khodadoust, M.T. Suidan, C.M. Acheson, and R.C. Brenner, 1999. "Solvent Extraction of Pentachlorophenol from Contaminated Soils using Water-Ethanol Mixtures," Chemosphere, **38**: 2681 - 2693.

K.M. Miller, M.T. Suidan, G.A. Sorial, A.P. Khodadoust, C.M. Acheson, and R.C. Brenner, 1998. "Anaerobic Treatment of Soil Wash Fluids from a Wood Preserving Site," Water Science and Technology, **38**: 63 - 72.

G.J. Wilson, A.P. Khodadoust, M.T. Suidan, R.C. Brenner, and C.M. Acheson, 1998. "Anaerobic/aerobic biodegradation of Pentachlorophenol Using GAC Fluidized Bed Reactors: Optimization of the Empty Bed Contact Time," Water Science and Technology, **38**: 9 - 17.

G.A. Murgel, L.W. Lion, C. Acheson, M.L. Shuler, D. Emerson, and W.C. Ghiorse, 1991. "An Experimental Apparatus for Selection of Adherent Microorganisms," Applied and Environmental Microbiology, **57**:1987 - 1996.

S.J. Coppella, C.M. Acheson, and P. Dhurjati, 1987. "Isolation of High-Molecular Weight Nucleic Acids for Copy Number Analysis Using High-Performance Liquid Chromatography," Journal of Chromatography, **402**:189 - 199.

S. J. Coppella, C.M. Acheson, and P. Dhurjati, 1987. "Measurement of Copy Number Using HPLC," Biotechnology and Bioengineering, **29**:646 - 647.

BIOGRAPHICAL SKETCH

NAME: James W. Allen

**POSITION TITLE: Acting Chief
Cellular Toxicology Branch
ECD**

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Maryland, College Park, MD	BS	1967	Zoology
Northeastern University, Boston, MA	MS	1971	Biology
University of Pittsburgh, Pittsburgh, PA	PhD	1974	Human Genetics

PROFESSIONAL EXPERIENCE

Acting Chief, Cellular Toxicology Branch, Environ. Carcinogenesis Division, NHEERL, U.S. EPA, Research Triangle Park, NC 2005-Present

Research Biologist, Cellular Toxicology Branch, Environ. Carcinogenesis Division, NHEERL, U.S. EPA, Research Triangle Park, NC 1995-2005

Research Biologist, Genotoxicity and Cellular Toxicology Branch, Genetic Toxicology Division, NHEERL, U.S. EPA, Research Triangle Park, NC 1980-1995

Adjunct Associate Professor, Integrated Toxicology Program, Duke University, Durham, NC 1992-Present

Adjunct Associate Professor, Curriculum in Toxicology, The University of North Carolina, Chapel Hill, NC 1986-Present

Senior Staff Fellow, National Institute of Environmental Health Sciences, Research Triangle Park, NC 1977-1980

Research Fellow, Harvard Medical School and Children's Hospital Medical Center, Boston, MA 1975-1977

PROFESSIONAL SOCIETIES

Environmental Mutagen Society (Councilor, 1986-1989 and 1994-1997)

Genetics and Environmental Mutagenesis Society

American Association for Cancer Research

Reproductive Biology Consortium

Applied Research Ethics National Association

Editorial Board, *Mutation Research - Letters*, 1981-1994, and - *Genetic Toxicology and Environmental Mutagenesis*, 1997 to present, sections.

SELECTED AWARDS AND HONORS

Recipient of EPA Science and Technologic Achievement Awards, 1997 (Level 3); 2004 (Level 1).
NHEERL Award for Exceptional Leadership of Institutional Animal Care and Use Committee, 2001
NHEERL Laboratory Director's Special Recognition Award (IACUC; AAALAC, Int. Recertification), 2002.

INVITED LECTURES/SYMPOSIA

Presentation on Regulations and Guidelines for Using Animals in Toxicology Research, Environmental Mutagen Society Meeting, San Diego, CA, 2001

Presentation on Regulations and Guidelines for Using Animals in Toxicological Research, International Conference on Environmental Mutagens, San Francisco, CA, 2005

Lectures in Cytogenetic Toxicology, University of North Carolina, Chapel Hill, NC, 1986-2003

Lectures in Genetic Toxicology, Duke University, Durham, NC, 1992-2003

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Expert panel member, FDA - Cellular Telecommunications meeting on RF genotoxicity, 2000
Participant in FASEB workshop on USDA proposed changes to animal welfare regulations, 2000
Reviewer of research proposals to FDA regarding RF genotoxicity, 2001
Contributor, IAEMS Online Training Module on Micronucleus Test, 2001
Reviewer/consultant: WHO IPCS Guidelines for monitoring of genotoxic effects of carcinogens in humans, 1999
UK Committee document on Mutagenicity Draft Guidelines, 2000
OECD Test Guidelines document on in vitro cell transformation assays, 2001, 2006
UNC Center for Environ. Health and Susceptibility Pilot Projects Program, 2003
Planning committee member, EMS/DOE International Human Germ Cell Mutagenesis Workshop, 2002
Advisor/mentor/host for six Ph.D. students and six postdoctoral/visiting scientists, 1985 to present

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Project Officer, Interagency Agreement with the US Department of Health and Human Services, NIH, NIEHS:
Workshop on "Assessing Human Germ Cell Mutagenesis in the Post Genome Era", 2004
Contributor to development of NHEERL Human Health Research and Drinking Water Implementation Plans;
Program projects in Harmonization of Cancer and Non-Cancer Risk Assessments, Dichloroacetic Acid, Bromate and Arsenic water contaminants, and Susceptible Populations (NCS, Aging), 2001-2004
Chair (1995-2001) and member (1986-2003), NHEERL Institutional Animal Care and Use Committee
NHEERL Technical Qualifications Board member, 1997-2000
Integrated Risk Information System, workgroup member on Acrylonitrile, 2003, 2006
NHEERL Divisional Liaison Officer, EPA Microarray Consortium, 1999-2001
NHEERL Imaging Core Facility Committee Member, 2003-present
NHEERL Veterinarian Search Committee, 2000, 2002
NHEERL Multipurpose QA/IACUC Protocol Development Committee, 2001
NHEERL Reviewer for American Petroleum Institute gasoline vapor studies, 2002-present
NHEERL New Facility Evaluation Panel member for deionized water contracts, 2002

PUBLICATIONS (16 out of a total of 102 publications)

1. Mori, C., J.W. Allen, D.J. Dix, N. Nakamura, M. Fujioka, K. Toshimori, and E.M. Eddy. Completion of meiosis is not required for acrosome formation in HSP70-2 null mice, **Biology of Reproduction**, 61:813-822, 1999.
2. Allen, J.W., B.W. Collins, A.J. Afshari, and J.F. Fuscoe. Dibenzo[a,l]pyrene induction of erythrocyte micronuclei in A/J and p53-deficient mice, **Polycyclic Aromatic Compounds** 16:51-60, 1999.
3. Allen, J.W., B.W. Collins, A. Lori, A.J. Afshari, M.H. George, A.B. DeAngelo, and J.C. Fuscoe. Erythrocyte and spermatid micronucleus analyses in mice chronically exposed to potassium bromate in drinking water, **Environmental and Molecular Mutagenesis**, 36:250-253, 2000.
4. Tian, D., H. Ma, Z. Feng, Y. Xia, X.C. Le, Z. Ni, J. Allen, B. Collins, D. Schreinemachers and J.L. Mumford. Analyses of micronuclei in exfoliated epithelial cells from individuals chronically exposed to arsenic via drinking water in Inner Mongolia, China, **Journal of Toxicology and Environmental Health, Pt. A**, 64:473-484, 2001.
5. Thai, S-F., J.W. Allen, A.B. DeAngelo, M.H. George and J.C. Fuscoe. Detection of early gene expression changes by differential display in the livers of mice exposed to dichloroacetic acid, **Carcinogenesis**, 22:1317-1322, 2001.
6. Barnes, J.A., D.J. Dix, B.W. Collins, B.W. Luft and J.W. Allen. Expression of inducible Hsp70 enhances the proliferation of MCF-70 breast cancer cells and protects against the cytotoxic effects of hyperthermia, **Cell Stress and Chaperones**, 6:316-325, 2001.
7. McDorman, E.W., B.W. Collins and J.W. Allen. Dietary folate deficiency enhances induction of micronuclei by arsenic in mice, **Environmental and Molecular Mutagenesis**, 40:71-77, 2002.
8. Barnes, J.A., B.W. Collins, D.J. Dix and J.W. Allen. Effects of heat shock protein 70 (Hsp70) on arsenite induced genotoxicity, **Environmental and Molecular Mutagenesis**, 40:236-242, 2002.

9. Thai, S-F., J.W. Allen, A.B. DeAngelo, M.H. George and J.C. Fuscoe. Altered gene expression in mouse livers after dichloroacetic acid exposure, **Mutation Research**, 543:167-180, 2003.
10. Kligerman, A.D., C.L. Doerr, A.L. Tennant, K. Harrington-Brock, J.W. Allen, E. Winkfield, P. Poorman-Allen, B. Kundu, K Funasaka, B. C. Roop, M.J. Mass, D.M. DeMarini, Methylated trivalent arsenicals as candidate ultimate genotoxic forms of arsenic: induction of chromosomal mutations but not gene mutations, **Environmental and Molecular Mutagenesis**, 42:192-205, 2003.
11. Geter, D.R., T.M. Moore, M.H. George, S.R. Kilburn, J.W. Allen, G.M. Nelson, E. Winkfield, A.B. DeAngelo. Tribromomethane exposure and dietary folate deficiency in the formation of aberrant crypt foci in the colons of F344/N rats, **Food and Chemical Toxicology**, 43:1405 -1412, 2005.
12. Delker, D., G. Hatch, J. Allen, B. Crissman, M. George, D. Geter, S. Kilburn, T. Moore, G. Nelson, B. Roop, R. Slade, A. Swank, W. Ward, A. DeAngelo, Molecular biomarkers of oxidative stress associated with bromate carcinogenicity, **Toxicology**, 221:158 -165, 2006.
13. Allen, J.W., D.C. Wolf, M.H. George, S.D. Hester, G. Sun, S-F. Thai, D. Delker, T. Moore, C. Jones, G. Nelson, B. Roop, S. Leavitt, E. Winkfield, W. Ward, S. Nesnow, Toxicity profiles in mice treated with hepatotumorigenic and non-hepatotumorigenic triazole conazole fungicides: propiconazole, triadimefon, and myclobutanil, **Toxicologic Pathology**, in press.
14. Wolf, D.C., J.W. Allen, M. George, S.D. Hester, G. Sun, J. Thibodeaux, T. Moore, S-F. Thai, D. Delker, E. Winkfield, S. Leavitt, G. Nelson, B. Roop, C. Jones, S. Nesnow, Toxicity profiles in rats treated with triazole conazole fungicides: propiconazole, triadimefon, and myclobutanil, **Toxicologic Pathology**, in press.
15. Ward W., D. Delker, S.D. Hester, S-F. Thai, D.C. Wolf, J.W. Allen, S. Nesnow, Transcriptional profiles in liver from mice treated with hepatotumorigenic and non-hepatotumorigenic triazole conazole fungicides: propiconazole, triadimefon, and myclobutanil, **Toxicologic Pathology**, in press.
16. Geter D.R., W.O Ward, G.W. Knapp, A.B. DeAngelo, J.A. Rubis, R.D. Owen, J.W. Allen, D.C. Delker, Kidney Toxicogenomics of chronic potassium bromate in F344 male rats, **Translational Oncogenomics**, in press.

BIOGRAPHICAL SKETCH

NAME: Ruth H. Allen

POSITION TITLE: Epidemiologist/Team Leader

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Rutgers University	BA	1966	Biology
Yale University	MFS, MS, M Phil. PhD	1972, 1973, 1974,1977	Environmental Science/Health
Johns Hopkins University	MPH Post Doctoral Fellow	1984, 1986	Epidemiology/ Biostatistics

PROFESSIONAL EXPERIENCE

2000-present US EPA, Office of Pesticide Programs, Human Health Effects, Epidemiology Team Leader: Pesticide Epidemiology, Surveillance and Review. Recognized international expert in pesticide health effects/ epidemiology/ exposure and human biomonitoring, direct HED teams, develop HED annual work plans on:

1. NHANES Analysis Develop new uses for human biomonitoring data in risk assessment and new innovative uses of National Health and Nutrition Examination Survey (NHANES); oversee staff work; and publish new methods for human biomonitoring data risk characterization. Establish science collaborations across Federal and State agencies, set workplans, according to shifting program priorities; coordinate periodic Sr. Mtg. briefings by CDC and NCI Division Directors on results of their multi-million dollar research programs. Establish Interagency Agreement (IAG) and provide contractor oversight for NHANES survey statistics analysis and methods development.
2. Agricultural Health Study (AHS). OPPTS Principal Collaborator for 10 year IAG with NIH/NCI; to bring the ORD and NCI program results to OPP including risk characterization and pesticide use data for 90,000 IA and NC pesticide applicators and 180+ chemicals. Coordinate AHS exposure and risk assessments and projects with 5 other Federal agencies, 2 States and 25 university collaborations on: cancer, respiratory disease, immunotoxicity, neurotoxicity, excess eye disease. For AHS ORD Field Biomonitoring Data, work closely with ORD (Kent Thomas) on joint analyses for comprehensive biomonitoring of over 100 AHS farms for NCI questionnaire validation and delivery of results to OPPTS for risk assessment and worker protection.
3. Pesticide Epidemiology Data. Principal focal point for internal and external customers on human health assessments/ pesticide epidemiology guidance development. Oversee creation of searchable Lotus Notes Pesticide Alerts Database, a tool to capture the epidemiological literature for pesticide health effects, as well as exposure studies arising from the Agricultural Health Study (AHS) and CDC's biomonitoring program. Use the High Pesticide Exposure Events (HPEE) published findings from the Agricultural Health Study (AHS) as input to OPP risk assessments.
4. NIOSH SENSOR/ AAPCC Project Officer (new). Manage NIOSH SENSOR IAG project; respond to State Public Health officials, manage acquisition and analysis of the American Association of Poison Control Centers (AAPCC) project for acute poisoning data used in RED production. Serve as senior reviewer of use of acute poisoning data from the EPA 6(a) (2), FIFRA industry reporting requirements, and data from the EPA/OPP hotline at Oregon State University. Consult regularly with Regional, State, and other stakeholders, industry and the public. Consult on Farm Worker Migrant Clinics, and medical staff training in recognition of pesticide health effects in migrant farm worker at medical monitoring clinics.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

2006 -present: Editorial Board for *J. Exposure Science and Environmental Epidemiology*

2003 -present: Assistant Editor for *Environmental Health Perspectives*

2001 -present: Yale University, adjunct faculty member for Health and Environment Initiative

SELECTED AWARDS AND HONORS

2004 EPA CIO Partnership Award: Environmental Health Database Design

2003 EPA Bronze Metal: Pesticides in Schools Team (Co-Chair)

2003 EPA Honor Award for Scientific Excellence: NHANES Analysis Team (Chair)

2003 EPA Honor Award for Scientific Excellence: (Individual Award)

INVITED LECTURES/SYMPOSIA

Mage DT, **Allen RH**, Kodali AC, Barr D, Needham L, and Smith WK. Interpretation of NHANES Pesticide Data Using the Johnson S_B Distribution. ISEE/ ISEA, Paris, France, Sept. 2006.

Allen RH, "Pesticide Epidemiology and Poisoning Surveillance in the Twenty-First Century" invited talk for Washington Statistical Society, June 15, 2006.

Allen RH, "Pesticide Epidemiology Cases Studies: Lessons for Worker Protection" invited talk for Council of State and Territorial Officers Annual Meeting, June 6, 2006.

Allen RH, "Pesticide Epidemiology, Exposure and Prevention: Lessons from Case Studies and the Agricultural Health Study" Invited talk for NIOSH SENSOR Winterfest, Jan. 26, 2006.

Allen RH, Ng YS, Allender HD, Christensen C, Mage DT, Kodali AC, Coble JB, Alavanja MC, and Hoppin J. AHS Inerts: Could It Be the "Other Ingredients?" Agricultural Health Study, National Advisory Panel Research Triangle Park, NC, March 3-4, 2005 (Repeated for Crop Life America, Inerts Task Force, Washington, DC, May 2005)

Allen RH, Kodali AC, Barr DB, Needham LL, and Mage DT. A Creatinine Correction for Children's Urinary Pesticide Concentrations. American Public Health Association, Dec. 10-14, 2005.

Allen RH, Kodali AC, Alavanja MC, Coble J, Allender H, Srivastava RB, Christensen C, Mage DT, and

Allen RH, "Usage of Agricultural Health Study (AHS) Epidemiology Data in a Regulatory Program, AHS National Advisory Panel, Washington DC, February 26, 2004

Allen RH, Christensen C, Conomos MG, Gandy G, Allender HD and Blondell, J. Pesticide Epidemiology, Biomonitoring, and Risk Assessment: Four Case Examples, Office of Environmental Information, April 15, 2004.

Allen RH, Kodali AC, Allender H, and Mage DT. Geography of Disease and Early Warning, India International Statistical Association, Hyderabad, India Dec 28, 2004.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

2006 -present: American Public Health Association, Epidemiology section Action Board Representative

2005 -present President, Yale University Executive Alumni Council, and Delegate to Yale Alumni Council

2004 -present Johns Hopkins University President's Alumni Council Representative for Public Health

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

OPP Incident Data Project, Data Analysis Subgroup

OPPTS Representative to the Interagency AHS Exposure Assessment Workgroup

EPA Representative, State & Community HANES Interagency Planning Project-SCHIPP

ISEA Mentoring Committee Chair

OPP Pesticide in Schools Workgroup (Co-Chair) (2001-2004)

OPPTS Representative, EPA Statistical Policy Advisory Committee (1988-2004)

EPA Representative, Office on Women's Health, Surgeon General's Interagency Task Force on Environment and

Women's Health (1995-2004)

PUBLICATIONS

Allen RH, Gody G, Mage DT, Kodali AC, Christensen C, Coble J, and Patricia Stewart P. Investigation of Job-related Pesticide Exposure in the NHANES-III. Accepted by *Environmental Health Perspectives* Sept. 2006.

Mage DT, Allen RH, Kodali AC, Smith WK. Interpretation of NHANES Pesticide Data Using the Johnson S_B Distribution. Submitted to *J Expo Science and Environ Epidemiol*. Fall 2006.

Alavanja MCR, Hou LF, Beane-Freeman L, Moore L, Mahajan R, Lynch S, Coble J, Dosemeci M, Blair A, Lubin J, Hayes R, Hsing A, Allen RH, Christensen C, Thomas K, Hoppin J, Sandler D, Hines C, Curwin B, Hodgson E, Rose RL, Rusiecki J, Bonner M, Cawthon RM, Lynch C. A Nested Case-Control, Molecular Epidemiology Study of Prostate Cancer in the Agricultural Health Study Cohort, National Cancer Institute Concept Paper, May 15, 2006.

Crowley MS, Leon HL, Correia J, Barrett R, Becker A, Chelminsk A, Higgins S, Allen RH, Owens E, Correa A, Calvert GM, Alarcon WA. A Report of Three Farmworkers Who Gave Birth to Infants with Severe Birth Defects Closely Grouped in Time and Place - Florida and North Carolina 2004-2005. Submitted to *Environmental Health Perspectives*, Summer 2006.

Bakke B, De Roos AJ, Barr DB, Stewart PA, Blair A, Lynch CF, Allen RH, Alavanja MCR, Roel Vermeulen R. Exposure to Selected Non-Persistent Pesticides among Corn Farmers During a Growing Season. Submitted to *Environmental Health Perspectives* Summer 2006.

Alexander BH, Bloemen L, Allen RH. Epidemiology of agricultural exposure and cancer. In *Agricultural exposures and cancer*. Guest Editors: Harris Pastides, Sir Richard Doll, John F. Acquavella, and Michael Alavanja, *Scandinavian Journal of Work, Environment and Health* 31 supp. 1: 5-7, 2005

Vermeulen R, DeRoos AJ, Bakke B, Blair A, Hildesheim A, Pinto L, Gillette, Lynch C, Allen RH, Alavanja MC. A Study of Immunological Responses to Exposures Encountered in Corn Farming. In: *The Agricultural Health Study Biomarkers Workshop on Cancer Etiology*. *J Biochem. Molecular Toxicology* Vol. 19, No. 3, 172, 2005

Alavanja MC, Bonner MR, Furlong CE, Allen RH, Hodgson E. Summary and Conclusions. In: *The Agricultural Health Study Biomarkers Workshop on Cancer Etiology*. *J Biochem. Molecular Toxicology* Vol. 19, No. 3, 192-193, 2005

Barr DB, Allen RH, Olsson AO, Bravo R, Montesano A, Nguyen J, Weerasekera G, Caltabiano LM, Udunka S, Walker RD, Whitehead Jr. RD, Schober SE, and Needham LL. Concentrations of Selective Metabolites of Organophosphorus Pesticides in US Population. *Environmental Research*, 2005, Available online at www.sciencedirect.com.

Mage DT, Allen RH, Goody G, Smith W, Barr DB, Needham, LL. Estimating Pesticide Dose from Pesticide Exposure Data by Creatinine Correction in the Third National Health and Nutrition Examination Survey (NHANES-III). *J Expo Anal Environ Epidemiol* Nov; 14(6): 457-65, 2004.

NARRATIVE

Future plans include publications from Ag Health and NHANES on human epidemiology and biomonitoring data to support advances in regulatory risk assessment, exposure science, and pesticide epidemiology.

BIOGRAPHICAL SKETCH

NAME: Gerald Ankley

POSITION TITLE: Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Michigan State University	B.S.	1982	Fisheries & Wildlife
University of Georgia	M.S.	1984	Fish Physiology
University of Georgia	Ph.D.	1987	Fish Physiology

PROFESSIONAL EXPERIENCE

1988-1995 Toxicologist
1995-1996 Acting Chief, Ecological Toxicology Branch
1996-2000 Toxicologist
2000-2003 Chief, Toxic Effects Characterization Branch
2003-2004/5 Acting Associate Director for Science
2004/5-now Toxicologist
U.S. Environmental Protection Agency
1993-now Adjunct Professor, Department of Biology
Michigan Technological University
1994-now Adjunct Professor, Conservation Biology
University of Minnesota

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Member of Society of Environmental Toxicology and Chemistry (SETAC)

Editorial Positions

Member of Editorial Board, Environmental Toxicology and Chemistry (1989-1993)
Aquatic Toxicology Editor, Environmental Toxicology and Chemistry (1997-2002)
Member of Editorial Board, Chemosphere (1996-2005)
Ecotoxicology Editor, Environmental Science and Technology Special Issue (2004)
Member of Editorial Board, Ecotoxicology and Environmental Safety (2004-2005)
Ecotoxicology Editor, Ecotoxicology and Environmental Safety (2005-present)

SELECTED AWARDS AND HONORS (Last 5 years)

2002 Identified by ISI as 6th most cited scientist in the world over last 10 years in the field of Environmental Science and Ecology
2003 STAA for journal article on test method with fish for endocrine-disrupting chemicals
2003 STAA for journal article on masculinization of fish by pulp mill effluent
2003 Listed by ISI as charter member of Highly Cited Researchers database
2003 EPA Bronze Medal for amphibian/UV research program
2004 STAA for journal article on EPA screening and testing program for EDCs
2004 STAA for series of journal articles for evaluating risk of changes in solar UV
2004 EPA Bronze Medal for technical support to EPA Program Offices
2004 EPA Bronze Medal for input to EPA Computational Toxicology Program
2004 EPA Bronze Medal for OECD activities
2005 STAA for journal articles on developmental effects of retinoids on amphibians
2005 STAA for journal articles concerning the ecological risk of trenbolone
2005 EPA/ORD Science Communications Award

INVITED LECTURES/SYMPOSIA (Last 2 years, of 75 total)

Critical data gaps and research needs for assessing the potential effects of EDCs in wildlife, WHO/IPCS Workshop, Tokyo, Japan
When girls aren't girls: Identification of androgens as an important class of environmental endocrine disruptors, Adelman Lecture Series, University of Minnesota, St. Paul, MN
Beyond oestrogens: a consideration of the ecological risk of androgens, Compendo Meeting-Endocrine Disruption in Wildlife, University of Exeter, Exeter, UK
A conceptual framework for assessing the ecological risk of pharmaceuticals, 25th Annual SETAC Meeting, Portland, WA
Linkage of exposure and effects using genomics, proteomics and metabonomics in small fish models, Computational Toxicology/STAR Program Meeting, RTP, NC
Genomics in ecological risk assessment: holy grail or hype? 26th Annual SETAC Meeting, Baltimore, MD

ASSISTANCE/LEADERSHIP TO THE SCIENTIFIC COMMUNITY (Last 5 years)

World Health Organization/United Nations Environmental Program (WHO/UNEP) review panel for document on environmental effects of ozone depletion
WHO/UNEP expert writing team for global assessment of human health and ecological risks of endocrine-disrupting chemicals
European Union (EU)/EPA committee for developing and coordinating joint endocrine disruptor research
Office of Economic Cooperation and Development (OECD) Validation Management Group for Ecotoxicological Test Methods (Co-chair)
OECD Fish Drafting Group for screening/testing protocols for endocrine-disrupting chemicals in fish

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY (Last 5 years)

EPA/ORD committee for human health and ecological effects research on endocrine-disrupting chemicals
EPA/OPPTS committee on the development and standardization of screening methods for endocrine-disrupting chemicals
EPA/ORD Steering and Implementation Committees for developing and implementing Computational Toxicology research program

PUBLICATIONS (Selected from last 5 years, of about 250 total)

Diamond, S.A., G.S. Peterson, J.E. Tietge and G.T. Ankley. Assessment of the risk of solar ultraviolet radiation to amphibians. III. Prediction of impacts in Northern Midwestern wetlands. *Environ. Sci. Technol.* 36, 2866-2874.
Ankley, G.T., K.M. Jensen, E.A. Makynen, M.D. Kahl, J.J. Korte, M.W. Hornung, T.R. Henry, J.S. Denny, R.L. Leino, V.S. Wilson, M.C. Cardon, P.C. Hartig and L.E. Gray. 2003. Effects of the androgenic growth promoter 17 β -trenbolone on fecundity and reproductive endocrinology of the fathead minnow (*Pimephales promelas*). *Environ. Toxicol. Chem.* 22, 1350-1360.
Degitz, S.J., G. Holcombe, P.A. Kosian, J. Tietge, E. Durhan and G.T. Ankley. 2003. Comparing the effects of stage and duration of retinoic acid exposure on amphibian limb development: chronic exposure results in mortality not limb malformations. *Toxicol. Sci.* 74, 139-146.
Ankley, G.T. and R.D. Johnson. 2004. Small fish models for identifying and assessing the effects of endocrine-disrupting chemicals. *Inst. Lab. Anim. Res. J.* 45, 469-483.
Ankley, G.T., D.W. Kuehl, M.D. Kahl, K.M. Jensen, B.C. Butterworth and J.W. Nichols. 2004. Partial life-cycle toxicity and bioconcentration modeling of perfluorooctanesulfonate in the Northern leopard frog (*Rana pipiens*). *Environ. Toxicol. Chem.* 23, 2745-2755.
Wilson, V.S., M.C. Cardon, J. Thornton, J.J. Korte, G.T. Ankley, J. Welch, L.E. Gray and P.C. Hartig. 2004. Cloning, expression and characterization of the androgen receptor and isolation of the estrogen receptor alpha from the fathead minnow (*Pimephales promelas*). *Environ. Sci. Technol.* 38, 6314-6321.
Ankley, G.T., K.M. Jensen, E.J. Durhan, E.A. Makynen, B.C. Butterworth, M.D. Kahl, D.L. Villeneuve, A. Linnum, L.E. Gray, M. Cardon, V.S. Wilson. 2005. Effects of two fungicides with multiple modes of action on reproductive

endocrine function in the fathead minnow (*Pimephales promelas*). *Toxicol. Sci.* 86, 300-308.

Ankley, G.T., M.C. Black, J. Garric, T.H. Hutchinson and T. Iguchi. 2005. A framework for assessing the hazard of pharmaceutical materials to aquatic species. In "Science for Assessing the Impacts of Human Pharmaceutical Materials on Aquatic Ecosystems", R. Williams, Ed. SETAC Press, Pensacola, FL. pp. 183-238.

Miracle, A.L. and G.T. Ankley. 2005. Ecotoxicogenomics: linkages between exposure and effects in assessing risks of aquatic contaminants to fish. *Repro. Toxicol.* 19, 321-326.

Ankley, G.T. and D.L. Villeneuve. 2006. The fathead minnow in aquatic toxicology: past, present and future. *Aquat. Toxicol.* 78, 91-102.

Ankley, G.T., G.P. Daston, S.J. Degitz, N.D. Denslow, R.A. Hoke, S.W. Kennedy, A.L. Miracle, E.J. Perkins, J. Snape, D.E. Tillitt, C.R. Tyler and D. Versteeg. 2006. Toxicogenomics in regulatory ecotoxicology. *Environ. Sci. Technol.* 40, 4055-4065.

Miller, D.H., K.M. Jensen, D.L. Villeneuve, M.D. Kahl, E.A. Makynen, E.J. Durhan and G.T. Ankley. 2006. Linkage of biochemical responses to population-level effects: a case study with vitellogenin in the fathead minnow. *Environ. Toxicol. Chem.* In Press.

Villeneuve, D.L., P. Larkin, I. Knoebl, A.L. Miracle, M.D. Kahl, K.M. Jensen, E.A. Makynen, E.J. Durhan, B.J. Carter, N.D. Denslow and G.T. Ankley. 2006. A graphical systems model for hypothesis-driven ecotoxicogenomics research on the teleost brain-pituitary-gonadal axis. *Environ. Sci. Technol.* In Press.

BIOGRAPHICAL SKETCH

NAME: Suzanne Ayvazian

POSITION TITLE: Supervisory Ecologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of New Hampshire	B.S.	1979	Zoology
University of Massachusetts @Lowell	M.S.	1983	Biology
University of Rhode Island	Ph.D.	1989	Zoology

PROFESSIONAL EXPERIENCE

Sept 2003- present Branch Chief/Supervisory Research Biologist, Atlantic Ecology Division, National Health and Environmental Effect Research Laboratory, U.S. EPA, Narragansett, RI

Sept 1993-Aug 2003 Senior Research Scientist, Estuarine and Coastal Fisheries, Department of Fisheries, Government of Western Australia, P.O. Box 20, North Beach, Western Australia

Sept 1993-Jan 200 University Honorary Research Fellow, Department of Zoology, The University of Western Australia, Nedlands, Western Australia

Jan 1991-Sept 1993 University Research Fellowship, Department of Zoology, The University of Western Australia, Nedlands, Western Australia

Sept 1989-Dec 1990 Faculty Research Associate, Department of Forestry and Wildlife, University of Massachusetts, Amherst, MA

Sept 1988-Sept 1989 Postdoctoral Research Associate, Department of Forestry and Wildlife, University of Massachusetts, Amherst, MA

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Society of Ichthyology and Herpetology
Estuarine Research Federation
Australian Marine Science Association
Australian Society of Fish Biologists
Society of Sigma Xi, 1983
Society of Phi Kappa Phi, 1988
Estuaries and Coasts-Associate Editor - 2002-present
Marine and Freshwater Research - International Advisory Member- 2004-present

SELECTED AWARDS AND HONORS

Summer 2003 Marine Biological Laboratory Summer Fellowship, Woods Hole, MA

INVITED LECTURES/SYMPOSIA

Estuarine Research Federation 2003 meeting, Co-chair symposium 'Understanding the biotic integrity of estuarine habitats'. Invited speaker "Australia's Estuary Report Card"

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Assisting development of SP2 NHEERL Multi-year Implementation Plan

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

NHEERL Liaison to OPPTS/EFED modeling workgroup

PUBLICATIONS

- 2006 Beckley, L. and Ayvazian, S. G. Oceans apart? Estuarine fisheries and conservation in south-eastern Africa and south-western Australia. Fourth World Fisheries Congress.
- 2005 Crawley, K. R., Hyndes, G. A. and S. G. Ayvazian. The influence of different volumes and types of detached macrophytes on fish community structure in surf zones of sandy beaches in south-western Australia. Marine Ecology Progress Series.
- 2004 Ayvazian, S.G., Bastow, T.P., Edmonds, J.S., How, J., and Nowara, G.B. Stock structure of Australian herring (*Arripis georgiana*) in southwest Australia. *Fisheries Research*. 67(1):39-53.
- 2002 Deegan, L. A., Wright, A., Ayvazian, S.G., Finn, J.T., Golden, H., Rand Merson, R., and Harrison, J. Nitrogen loading from upland areas alters seagrass support of higher trophic levels. *Aquatic conservation: Marine and freshwater ecosystem*. 12 (2): 193-212.
- Ayvazian, S.G., Wise, B.S. and Young, G.C. Short-term hooking mortality of tailor (*Pomatomus saltatrix*) in Western Australia and the impact on yield per recruit. *Fisheries Research*. 58(2): 241-248.
- 1999 Young, G.C., Wise, B.S. and Ayvazian, S.G. A tagging study on tailor (*Pomatomus saltatrix*) in Western Australian waters: Their movement, exploitation, growth and mortality. *Marine and Freshwater Research* 50: 633-642.
- Lenanton, R.C., Ayvazian, S.G., Dibden, C., Jenkins, G., and Sarre, G. The use of stock enhancement to improve the catch rates of black bream, *Acanthopagrus butcheri* (Munro) for Western Australian recreational fishers. Eds. Howell, B.R., Mokness, E., and Svasand, T. In. Stock Enhancement and Sea Ranching. Fishing News Books. Pp. 219-230.

BIOGRAPHICAL SKETCH

NAME: Mark Bagley

POSITION TITLE: Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of California, San Diego	B.A.	1984	Ecology, Behavior and Evolution
University of California, Davis	M.S.	1992	Animal Science
University of California, Davis	Ph.D.	1997	Genetics

PROFESSIONAL EXPERIENCE

2004- Acting Chief, Molecular Ecology Research Branch, U.S. EPA/ORD, Cincinnati, OH
2001-2004 Adjunct Assistant Professor, Miami University, Oxford OH
1999-2004 Research Biologist, U.S. EPA/ORD, Cincinnati, OH
1998-1999 Research Associate, University of California, Davis
1996-1998 Postdoctoral Research Fellow, University of North Carolina, Wilmington

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Member American Society of Ichthyologists and Herpetologists, Society for Conservation Biology,
 American Fisheries Society
Reviewer Molecular Ecology, Journal of Heredity, Canadian Journal of Fisheries and Aquatic Sciences,
 Bulletin of the California Dept. of Fish and Game, Environmental Biology of Fishes

SELECTED AWARDS AND HONORS

Federal Bronze Metal, US EPA,ORD, 2006

INVITED LECTURES/SYMPOSIA

(5 of at least 12 invited seminars in last 5 years)

Bagley, M. J., S. A. Christ, S. E. Franson, A. C. Leonard, AND G. P. Toth. Geographic and environmental correlates of regional population genetic structure in the central stoneroller (*Campostoma anomalum*). Presented at American Society of Ichthyologists and Herpetologists, Kansas City, MO, July 3-8, 2002

Bagley, M. J., S. E. Franson, AND S. A. Christ. Associations between genetic diversity and anthropogenic disturbance in Midwestern stream dwelling minnows. presented at American Fisheries Society 2003 Annual Meeting, Quebec, Canada, August 9-15, 2003.

Bagley, M. J. Ecological genetics research at the USEPA. Presented at Buffalo State College, Buffalo, NY, November 5, 2003

Bagley, M. J., S. A. Christ, K. H. Mills, AND S. M. Chalanchuk. Changes in genetic diversity of a white sucker population following experimental whole-lake acidification. Presented at American Fisheries Society, Madison, WI, August 21-26, 2004.

Bagley, M. J. Molecular indicators of genetic diversity: Utility at local and regional scales. Presented at Workshop on Environmental Indicators, Kansas City, MO, May 19, 2004

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Project Lead, Advanced Monitoring Initiative project to improve biomonitoring with DNA barcode methods.
(collaboration with Smithsonian Institution, Maryland Department of National Resources, University of Guelph, Consortium for the Barcode of Life, and EPA Office of Water).
Dissertation committee member for Ph.D. students at University of Cincinnati and Miami University.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Member, Biotechnology Initiative Steering Committee (2003- present)
Organizer, joint ORD-OPP workshop on application of population genetics to agroecosystem management (2005).

PUBLICATIONS

- McMillan, A.M., Bagley, M.J., Jackson, S.J., Nacci, D.E. 2006. Genetic diversity and structure of an estuarine fish (*Fundulus heteroclitus*) indigenous to sites associated with a highly contaminated urban harbor. *Ecotoxicology* 15, 539-548.
- Tepolt, C.K, Bagley, M.J., Geller, J.B., and M.J. Blum. 2006 Characterization of microsatellite loci in the European green crab (*Carcinus maenas*). *Molecular Ecology Notes* 6, 343-345.
- Bagley, M.J., S.A. Jackson, S.E. Franson, E.R. Waits, 2004. Genetic diversity of stream fish in the Mid-Atlantic Integrated Assessment Area: Implications for ecological monitoring and assessment programs. EPA/600/R-04/175. U.S. Environmental Protection Agency, Cincinnati, OH. 87 pp.
- McMillan, A.M., Bagley, M.J., and Evers. D.C. 2004. Characterization of seven polymorphic microsatellite loci in the Common Loon (*Gavia immer*). *Molecular Ecology Notes*, 4, 297-299.
- Tranah, G. J., Bagley, M., Agresti, J.J., May, B. 2003. Development of codominant markers for identifying species hybrids. *Conservation Genetics*, 4, 537-541.
- Lazorchak, J.M., Hill, B.H., Brown, B.S., McCormick, F.H., Engle, V., Lattier, D.J., Bagley, M.J., Griffith, M.B. 2003. USEPA biomonitoring and bioindicator concepts needed to evaluate the biological integrity of aquatic systems. Pp 831-874 in T. Breure (Ed.) *Bioindicators/ Biomonitoring: Principles, Assessment, Concepts*. Elsevier Science, Ltd, UK
- Bagley, M.J., Franson, S.E., Christ, S.A. Waits, E.R., Toth, G.P. 2002. Genetic diversity as an indicator of ecosystem condition and sustainability. EPA Report No. 600R-03-056. 85 pp.
- Bagley, M.J., S.L. Anderson, and B.P. May. 2001. Choice of Methodology for Assessing Genetic Impacts of Environmental Stressors: Polymorphism and Reproducibility of RAPD and AFLP Fingerprints. *Ecotoxicology* 10, 239-244.
- Iturra, P, M. Bagley, N. Vergara, P. Imbert, J.F. Medrano. 2001. Development and characterization of DNA sequence OmyP9 associated with the sex chromosomes in rainbow trout. *Journal of Heredity*, 86, 412-419.
- Dimoski, P., G.P. Toth, and M.J. Bagley. 2000. Characterization of microsatellites for the central stoneroller, *Camptostoma anomalum* (Pisces: Cyprinidae). *Molecular Ecology* 9:2187-2188.
- Bagley, M.J., D.L. Lindquist and J.B. Geller. 1998. Microsatellite variation, effective population size and population genetic structure of vermilion snapper, *Rhomboplites aurorubens*, off the southeastern United States. *Marine Biology* 134:609-620.
- Bagley, M.J., and G.A.E. Gall. 1998. Mitochondrial and nuclear DNA sequence variability among populations of rainbow trout (*Oncorhynchus mykiss*). *Molecular Ecology* 7: 945-961.
- Bagley, M.J., and J.B. Geller. 1998. Characterization of microsatellite loci in the vermilion snapper (*Rhomboplites aurorubens*). *Molecular Ecology* 7:1089-1090.
- Iturra, P, J.F. Medrano, M. Bagley, N. Lam, N., Vergara, J.C. Marin. 1998. Identification of sex chromosome molecular markers using RAPDs and fluorescent in situ hybridization in rainbow trout. *Genetica* 101: 209-213.
- Bagley, M.J., J.M. Medrano and G.A.E. Gall. 1997. Polymorphic molecular markers from anonymous nuclear DNA for genetic analysis of populations. *Molecular Ecology*, 6: 309-320.
- Bartley, D., M.J. Bagley, G.A.E. Gall and B. Bentley. 1992. The use of linkage disequilibrium to estimate effective size of fish populations. *Conservation Biology* 6:365-375.

BIOGRAPHICAL SKETCH

NAME: Mace G. Barron

POSITION TITLE: Branch Chief

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Oregon State University, Department of Fisheries and Wildlife, Corvallis, OR	B.S.	1980	Fisheries Science
University of Minnesota, Department of Fisheries, University of Minnesota	M.S.	1982	Fisheries Science
Washington State University, College of Pharmacy, Pullman, WA	Ph.D.	1986	Toxicology

PROFESSIONAL EXPERIENCE

2004-present Branch Chief, Biological Effects and Population Response Branch, Gulf Ecology Division, National Health and Environmental Effects Research Laboratory (NHEERL), Office of Research and Development (ORD), U.S. Environmental Protection Agency (USEPA), Gulf Breeze, FL.

1999-2003 Chief Scientist/Consultant, P.E.A.K. Research, Longmont, CO ?

1994-1999 Senior Associate, Hagler Bailly/Stratus Consulting, Global Environmental Practice, Boulder, CO

1990-1994 Department Manager, Aquatic Toxicology Laboratory, Environmental Science & Engineering, Inc., Gainesville, FL

1987-1990 Project Leader and Senior Research Toxicologist, Environmental Toxicology and Chemistry Research Laboratory, The Dow Chemical Company, Midland,

1986-1987 Post-Doctoral Associate, University of Florida, St. Augustine, FL?

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Member, Society of Environmental Toxicology and Chemistry

Member, Society of Toxicology

Associate Editor, Environmental Toxicology and Chemistry, 2000-2004

Editorial Board, Aquatic Toxicology, 2003-present

SELECTED AWARDS AND HONORS

NHEERL Team Work Award (2005)

NHEERL Award for Effort (2006)

National Award for outstanding dissertation in environmental sciences

INVITED LECTURES/SYMPOSIA

2005 Ecotoxicology and Global Change Research at the U.S. EPA Gulf Ecology Division. Invited Seminar. University of Florida, Gainesville, FL.

2004 Dispersant-Oil Toxicity: Phototoxicity and CROSERF Methodology Considerations. Invited Seminar. National Academy of Sciences. Washington D.C.

2002 Photoenhanced toxicity of oil. Invited Seminar. Colorado School of Mines, Golden, Colorado.

2002 Photoenhanced Toxicity of Alaska North Slope Crude Oil to Pacific Herring. Invited Seminar and Public Presentation; Prince William Sound Regional Citizens' Advisory Council, Anchorage, Alaska.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Toxicity Estimation shortcourse, Instructor, SETAC Europe, The Hague, The Netherlands, 2005

Steller Sea Lion Contaminants Workshop. Organizer of NMFS sponsored workshop. Anchorage, Alaska, 2001

Ecological Risk Assessment. Workshop organizer and instructor. Denver, Colorado, 2001

Expert Witness for the U.S. Department of Justice; Oil spills and PCBs, Washington, D.C. 2000-2004.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

NHEERL PARs advisory workgroup, 2005

NHEERL Focus Group on Authorship, 2005

Office of Water Aquatic Life Criteria Guideline Development Subcommittee

Safe Pesticides/Safe Products Research Implementation Team

PUBLICATIONS [20 of 35 published 1998-2006]

Raimondo, S, C. L. McKenney, MG Barron. 2006. Application of Perturbation Simulations in Population Risk Assessment for Different Life History Strategies and Elasticity Patterns. *Human and Ecological Risk Assessment*. 12(5): 983-999

Barron, M.G and K.J. Barron. 2005. Glacial influences on solar radiation in a subarctic sea. *Photochem. Photobiol.* 81:187-189.

Barron, M.G., M.G. Carls, J.W. Short, S.D. Rice, R. Heintz, and S.D. Rice. 2005. Assessment of the phototoxicity of weathered Alaska North Slope crude oil to juvenile pink salmon. *Chemosphere* 60:105-110.

Barron, M.G. and S. Wharton. 2005. Survey of methodologies for developing media screening values for ecological risk assessment. *Integrat. Environ. Assess. Manage.* 1:320-332.

Barron, M.G., SE Duvall, and KJ Barron. 2004. Retrospective and Current Risks of Mercury to Panthers in the Florida Everglades. *Ecotoxicol.* 13:223-229.

Barron, M.G., M.G. Carls, R. Heintz, and S.D. Rice. 2004. Evaluation of fish early-life stage toxicity models of chronic embryonic exposures to complex PAH mixtures. *Tox. Sci.* 78:60-67.

Barron, M.G., R. Heintz, and S.D. Rice. 2004. Relative potency of PAHs and heterocycles as aryl hydrocarbon receptor agonists in fish. *Mar. Environ. Res.* 58:95-100.

Barron, M.G., M.G. Carls, J.W. Short and S.D. Rice. 2003. Photoenhanced toxicity of aqueous phase and chemically dispersed weathered Alaska North Slope crude oil to Pacific herring eggs and larvae. *Environ. Toxicol. Chem.* 22:650-660.

Barron, M.G., R Heintz and MM Krahn. 2003. Contaminant exposure and effects in pinnipeds: implications for declines of Steller sea lions in Alaska. *Sci. Total Environ.* 311:111-133.

Barron, M.G. and E. Holder. 2003. Are PAH exposure and ecological risks underestimated at petroleum contaminated sites? *Human Ecol Risk Assess* 9:1533-1547.

Barron, M.G. and L. Ka'aihue. 2003. Critical evaluation of CROSERF test methods for oil dispersant toxicity testing under subarctic conditions. *Marine Poll. Bull.* 46:1191-1199.

Barron, M.G., J. Hansen and J. Lipton. 2002. Association between contaminant tissue residues and adverse effects in aquatic organisms. *Rev. Environ. Contamin. Toxicol.* 173:1-37.

- Duesterloh, S., J. Short, and M.G. Barron. 2002. Photoenhanced toxicity of weathered Alaska North Slope crude oil to two species of marine calanoid zooplankton. *Environ. Sci. Technol.* 36:3953-3959.
- Barron, M.G. and S. Albeke. 2000. Calcium control of zinc uptake in rainbow trout. *Aquat. Toxicol.* 50:257-264.
- Barron, M.G., E.E. Little, R.D. Calfee, and S. Diamond. 2000. Quantifying solar spectral irradiance in aquatic habitats for the assessment of photoenhanced toxicity. *Environ. Toxicol. Chem.* 19: 920-925.
- Barron, M.G., I.R. Schultz, and M.E. Newman. 2000. Pharmacokinetics of zinc⁶⁵ following intravascular administration in channel catfish. *Ecotox. Environ. Safety* 45:304-309.
- Barron, M.G., M.J. Anderson, S. The, D.E. Hinton, J. Zelikoff, A. Dikkeboom, D. Tillitt and N. Denslow. 2000. PCB contamination and biomarker responses in walleye from Green Bay, Lake Michigan. *J. Great Lakes Res.* 26:250-271.
- Cleveland, L, E.E. Little, R.D. Calfee, and M.G. Barron. 2000. Photoenhanced toxicity of a weathered oil to *Mysidopsis bahia*. *Aquat. Toxicol.* 49:63-76.
- Duvall, S.E., and M.G. Barron. 2000. A screening-level probabilistic ecological risk assessment of mercury in Florida Everglades food webs. *Ecotoxicol. Environ. Safety.* 47: 298-305.
- Little, E.E., L. Cleveland, R. Calfee, and M.G. Barron. 2000. Assessment of the photoenhanced toxicity of a weathered oil to the tidewater silverside. *Environ. Toxicol. Chem.* 19: 926-932.

BIOGRAPHICAL SKETCH

NAME: Hugh A. Barton

POSITION TITLE: Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Massachusetts Institute of Technology	B.S.	1982	Life Sciences
Massachusetts Institute of Technology	Ph.D.	1988	Toxicology
Massachusetts Institute of Technology	Postdoc.	1988-89	Biology

PROFESSIONAL EXPERIENCE

2005-Present Toxicologist, National Center for Computational Toxicology, USEPA, NC
2003 – Present Adjunct Assistant Professor, Curriculum in Toxicology, UNUC-Chapel Hill
2001-2005 Toxicologist, PKB, ETD, NHEERL, RTP, NC
1999-2001 Branch Chief, PKB, ETD, NHEERL, RTP, NC
1995-1999 Toxicologist, ICF Consulting, KS Crump Group, RTP, NC
1991-1995 Toxicologist, ManTech Environmental, WPAFB, OH
1990-1993 Adjunct Assistant Professor, School of Public Health, Boston University, MA
1989-1991 Toxicologist, ENSR Consulting and Engineering, Acton, MA

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Toxicology, AAAS, American Chemical Society, Regulatory Toxicology and Pharmacology, Editorial Board.

SELECTED AWARDS AND HONORS

ORD Award for Outstanding Technical Assistance To Program Offices for Assisting the Office of Pesticides on Iodomethane Risk Assessment, Sept 2006
Bronze Award for preparing Approaches for the Application of Physiologically Based Pharmacokinetic Models and Supporting Data in Risk Assessment, ORD, Sept 2006
Silver Award for Scientific Workgroups for EPA's Guidelines for Carcinogen Risk Assessment and Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens, ORD. April 2006.
Bronze Award for Development of PFOA Risk Assessment, OPPTS, June 2005
Bronze Award for Promoting Strong Science in Agency Decisions, OSP, ORD, Aug 2004.
Best Paper, Society of Risk Analysis, 2002.
Best Paper, Risk Assessment Specialty Section of SOT, 2001.
Best Paper, Risk Assessment Specialty Section of SOT, 2000.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Biological Modeling Specialty Section, Society of Toxicology. Past-President 2003, President 2002, Vice-President 2001.
ILSI-HESI Technical Committee on Agricultural Chemical Safety Assessment. Co-Chair of ADME Task Force. 2002 – 2005.
Dosimetry and Potential Impacts on Reproductive/Developmental Study Design and Interpretation for Risk or Safety Assessment. Chaired & Organized Workshop at Society of Toxicology. New Orleans, LA. March 9, 2005.
Cumulative risk assessment: getting from toxicology to quantitative analysis. Chaired & Organized Workshop at Society of Toxicology, March 2003, Salt Lake City, UT.
SCOPE-IUPAC (Scientific Committee on Problems of the Environment, International Council for Science – International Union of Pure and Applied Chemistry) committee on Environmental Implications of Endocrine Active Substances: Present State of the Art and Future Research Needs. Yokohama, Japan, Nov 2002.
Working Group on Direct Dosing of Neonatal Animals in Toxicity Testing, Sponsored by International Life

Sciences Institute (ILSI), Sept. 2000 - Sept. 2002, Washington, DC.
Endocrine Disruptors Low Dose Peer Review, Sponsored by USEPA and NIEHS/NTP,
Oct 10 – 12, 2000, Research Triangle Park, NC.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Chair, NHEERL Human Health Research Steering Committee 2000 – 2005.
Author, OPPT, Pharmacokinetic Analysis for Draft Risk Assessment of the Potential Human Health Effects
Associated With Exposure to Perfluorooctanoic Acid and Its Salts (PFOA) 2002 – 2006.
Author, Risk Assessment Forum, Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to
Carcinogens; Presentations to Science Advisory Board and Committee on Natural Resources 2002 – 2005.
Consulting, OPP, OPPT, ORD, and NCEA, Physiologically Based Pharmacokinetic (PBPK) Modeling and
Pharmacokinetics in Risk Assessment 1999 – 2006.

INVITED LECTURES/SYMPOSIA (Selected from a total of 24 in the last 5 years)

Predictive Modeling in Neurotoxicology. *Lecture in Advanced Toxicology* course for
curriculum in Toxicology at University of North Carolina. Nov. 14, 2001.
Modeling Endocrine Active Compounds Across Life Stages. *Symposium on the Potential for Biological
Modeling to Improve Children's Risk Assessment, Society of Toxicology*, March 2002, Nashville, TN (Abstract #268,
The Toxicologist)
Predictive Simulation Modeling for Antiandrogen Impacts on Rodent Prostate. *Symposium on Biostatistical
and Biomathematical Problems in Environmental Health*. Sponsored by NIEHS, University of North Carolina,
Department of Biostatistics and Center for Environmental Health and Susceptibility. Research Triangle Park, NC.
June 7, 2002.
Linking Dose, Mode of Action, and Response in a Human Health Risk Assessment Context.
*Physiologically-Based Pharmacokinetic (PBPK) Approaches to Human Health Risk Assessment ORD/OPPTS
Scientist-to-Scientist Meeting*. Arlington, VA. Nov. 6-7, 2002
Endocrine Active Substances and Dose-Response for Individuals and Populations. *Symposium on Endocrine
Active Substances*. Sponsored by SCOPE/IUPAC Yokohama, Japan. Nov 17 - 21, 2002.
The PBPK Approach in Species, Dose, and Route Extrapolation. *Pharmacokinetics Continuing Education
course, Society of Toxicology*. Salt Lake City, UT. March 9, 2003.
Children's Supplemental Cancer Guidelines and Life-stage Risk. *US EPA Regional Risk Assessors
Conference*, Stone Mountain, GA. April 29, 2003.
Physiologically Based Pharmacokinetic (PBPK) Modeling and Mode of Action in Dose-
Response Analysis. *Mode of Action in Risk Assessment Symposium. Environmental Mutagen Society*, Miami, FL
May 12, 2003.
Physiologically Based Pharmacokinetic (PBPK) Modeling to Determine the Human Equivalent
Concentration (HEC). *US EPA Regions/OSRTI/ORD Workshop on Inhalation Risk Assessment: A Superfund Focus*,
Washington, DC Sept 9 - 12, 2003.
Computational Pharmacokinetics During Developmental Windows of Susceptibility. *Toxicology and Risk
Assessment Conference*, Cincinnati, OH April 26-30, 2004
EPA's Draft Supplemental Guidance: Scientific Analysis, Proposed Guidance, and Current Status.
*Workshop on EPA's Proposed Guidance for Assessing Cancer Risks from Early Life Exposures. International
Society of Regulatory Toxicology and Pharmacology*. February 10, 2005, Baltimore, MD.
Absorption, Distribution, Metabolism, and Elimination in Agricultural Chemical Safety Assessment. *ILSI
HESI Workshop on Framework Approaches to Risk Assessment*. Nice, France, November 14-16, 2005.
Refining Human Risk Assessment through Comparisons of Human and Animal Internal Dosimetry: PFOA
as a Case Example. *32nd Annual Summer Meeting, Toxicology Forum*. Aspen, CO. July 13, 2006.
Postnatal Pharmacokinetics. Developmental Pharmacokinetics Continuing Education Course, *Teratology
Society Annual Meeting*, Tucson, AZ. June 27, 2006.

PUBLICATIONS (selected from a total of 45 papers)

1. Barton, H.A., Creech, JR., Godin, C.S., Randall, G.M., and Seckel, C.S. (1995) Chloroethylene mixtures: pharmacokinetic modeling and in vitro metabolism of vinyl chloride, trichloroethylene, and trans-1,2-dichloroethylene in rat. *Toxicol. Appl. Pharmacol.* 130, 237-247.
2. Andersen, M.E. and Barton, H.A. (1999) Biological regulation of receptor-hormone complex concentrations in relation to dose response assessments for endocrine active compounds. *Toxicol. Sci.* 48, 38-50.
3. Barton, H.A., Deisinger, P.J., English, J.C., Gearhart, J.M., Faber, W.D., Tyler, T.R., Banton, M.I., Teeguarden, J., and Andersen, M.E. (2000) Family approach for estimating reference concentrations/doses for series of related organic chemicals. *Toxicol. Sci.* 54, 251-261.
4. Barton, H.A. and Clewell, H.J., III. (2000) Evaluating Noncancer Effects of Trichloroethylene: Dosimetry, Mode of Action and Risk Assessment. *Environ. Health Perspect.*, 108, Suppl 2, 335-342.
5. Clewell, H.J. III, Andersen M.E., and Barton H.A. (2002) A Consistent Approach for the Application of Pharmacokinetic Modeling in Cancer and Noncancer Risk Assessment. *Environ. Health Perspect.* 110, 85-93.
6. Barton HA (2003) Endocrine Active Substances and Dose-Response for Individuals and Populations. *Pure Appl Chem* 75, 2159-2166.
7. Teeguarden, J.G. and Barton, H.A. (2004) Computational Modeling of Serum Binding Proteins and Clearance in Extrapolations across Life-Stages and Species for Endocrine Active Compounds. *Risk Anal.* 24, 751-770.
8. Clark, L.H., Setzer, R.W. and Barton, H.A. (2004) Framework for Evaluation of Physiologically-Based Pharmacokinetic Models for Use in Safety or Risk Assessment. *Risk Anal* 24, 1697-1718.
9. Barton, H.A. (2005) Computational pharmacokinetics during developmental windows of susceptibility. *J Toxicol Environ Health A* 68:889-900.
10. Barton, H.A., Cogliano, V.J., Flowers, L., Valcovic, L., Setzer, R.W., and Woodruff, T (2005) Assessing Susceptibility from Early-Life Exposure to Carcinogens. *Environ Health Perspect* 113(9):1125-33
11. Teeguarden, J.G., Waechter, J.M., Jr., Clewell, H.J., III, Covington, T.R., and Barton, H.A. (2005) Evaluation of oral and intravenous route pharmacokinetics, plasma protein binding and uterine tissue dose metrics of BPA: A physiologically based pharmacokinetic approach. *Toxicol Sci* 85: 823-838
12. Barton, H.A., Baetcke, K., Chambers, J.E., Diliberto, J., Driver, J.H., Hastings, C.E., Iyengar, S., Krieger, R., Pastoor, T., Stahl, B., and Timchalk, C. (2006) The Acquisition and Application of Absorption, Distribution, Metabolism, and Excretion (ADME) Data in Agricultural Chemical Safety Assessments. *Crit Rev Toxicol* 36; 9-35
13. Yoon M, Madden MC, and Barton HA. (2006) Developmental Expression of Aldehyde Dehydrogenase in Rat: a Comparison of Liver and Lung Development. *Toxicol Sci.* 89:386-398
14. Potter, L.K., Zager, M.G., and Barton, H.A. (2006) A Mathematical Model for the Androgenic Regulation of the Prostate in Intact and Castrate Adult Male Rats. *Am J Physiol Endocrinol Metab* (epub doi:10.1152/ajpendo.00545.2005).

BIOGRAPHICAL SKETCH

NAME: Elizabeth G. Bayne

POSITION TITLE: ASPH Environmental Health Fellow

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Pittsburgh	B.S.	2004	Ecology and Evolution
Yale University, School of Epidemiology and Public Health	M.S.	2006	Environmental Health Sciences

PROFESSIONAL EXPERIENCE

- 2006 Graduate Research Assistant, The Alice Ferguson Foundation: Trash Free Potomac Watershed Initiative, Washington, DC
- 2005 Film Production Intern, Durrin Productions, Inc, Washington, DC
- 2005 Research Assistant, Naugatuck Valley Project/WHCC Griffin Hospital, New Haven, CT
- 2002 Intern, Mollusk Department, Carnegie Museum of Natural History, Pittsburgh, PA
- 2001-00 Jean Hamilton Walls/QUEST Research Intern, UPMC Cell Biology and Physiology Department, Pittsburgh, PA

SELECTED AWARDS AND HONORS

- Howard Hughes Research Fellowship, 2002
- Award for Excellence in the J. H. Walls Undergraduate Research Program, 2001

INVITED LECTURES/SYMPOSIA

- Oral presenter, "Qualitative analysis of the need for medical interpreting services for Spanish speaking immigrant community", APHA 133rd Annual Meeting and Exposition, Philadelphia, PA, 2005
- Poster presenter, "Modulation of Androgen Receptor Transcriptional Activity in Ovarian", University of Pittsburgh Undergraduate Scientific Poster Session, Pittsburgh, PA, 2001

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

- Principle Investigator in student thesis, "Association of sewer system overflows with human and aquatic health", Yale University, School of Epidemiology and Public Health, New Haven, CT, 2006
- Co-Chair, Yale Health CORE, Outreach initiative, Isla de Mendez, El Salvador, 2005-06

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

- Support and assistance for Safe Pesticides/Safe Products (SP2) and EDCs Program Director, ORD, 2006-Present
- Poster Judge, 2006 EPA STAR Graduate Fellowship Conference, 2006

PUBLICATIONS

- Pearce, T. and E. Bayne. 2003. *Arion hortensis* Ferussac, 1819, Species Complex in Delaware and Pennsylvania, Eastern USA. *The Veliger* 46:362-363.
- Bayne, E. (In Press). Impact of global warming on drinkable water. *Yale Journal of Public Health*.4(1).

NARRATIVE

Currently provide assistance to Office of Research and Development SP2 and EDC research programs, while exploring activities of other agency offices and research centers. Independent research objectives of fellowship center on urban water ecology, promotion of environmental health literacy, and community outreach.

BIOGRAPHICAL SKETCH

NAME: David C. Bencic

POSITION TITLE: Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Kalamazoo College, Kalamazoo, MI	B.A.	1993	Biology
University of Idaho, Moscow, ID	Ph.D.	1999	Zoology

PROFESSIONAL EXPERIENCE

Research Biologist

August 2004 to Present

U.S. Environmental Protection Agency
National Exposure Research Laboratory
Ecological Exposure Research Division
Molecular Indicators Research Branch
Cincinnati, OH 45268

Postdoctoral Fellow

July 2002 to August 2004

Duke Integrated Toxicology Program
Nicholas School of the Environment and Earth Sciences
Duke University
Durham, NC 27708-0328

Postdoctoral Fellow

June 2000 to June 2002

Department of Cell and Developmental Biology
210 Taylor Hall, CB#7090
University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-7090

Postdoctoral Fellow

January 2000 to May 2000

Dr. Joseph G. Cloud
Department of Biological Sciences
University of Idaho
Moscow, ID 83844-3051

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Environmental Toxicology and Chemistry
American Society for Cell Biology
American Association for the Advancement of Science

SELECTED AWARDS AND HONORS

Superior Accomplishment and Recognition (S) award (2005) from the U.S. EPA/ORD/NERL/EERD/MIRB for leadership of the Small Fish Model Computational Toxicology Project.

On-the-spot (OTS) award (2004) from the U.S. EPA/ORD/NERL/EERD/MIRB for work on a CRADA microarray research project.

INVITED LECTURES/SYMPOSIA

Bencic, D.C., Krisfalusi, M., Cloud, J.G., and R.L. Ingermann. 1998. Maintenance of trout (*Oncorhynchus mykiss*) sperm *in vitro* under different oxygen tensions alters ATP content and

cell functional characteristics. *19th Congress of the European Society of Comparative Physiology and Biochemistry*. Turku, Finland.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Collaborative study with the University of Florida, Florida Atlantic University, Purdue University, and Oregon Health and Science University to examine linkages of exposure and effects of model chemicals targeting the HPG axis in small fish models using genomics, proteomics, and metabonomics.

Collaborative discussions with Lawrence Livermore National Laboratory dealing with the use of various approaches to study differential gene expression in small fish models to monitor toxicant exposure.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Participating as a member of the Data Analysis Workgroup, a component of the Genomics Technical Framework Workgroup which was formed in order to establish a framework for the U.S. EPA for analysis and acceptance criteria of genomics information for scientific and regulatory purposes.

Developing a method to reduce variability in Vg gene expression and establish a “standard curve” of exposure in fathead minnows in response to EDCs.

PUBLICATIONS

Biales, A.B., **Bencic, D.C.**, Flick, R.W., Lazorchak, J., and D. L. Lattier. 2007. A quantitative real-time PCR assay for the quantification of vitellogenin transcripts in the fathead minnow (*Pimephales promelas*): An analysis of variability. *In Press*.

Hinton, D.E., Kullman, S.W., Volz, D.C., Hardman, R.C., Chen, P.-C., Carney, M., and **D.C. Bencic**. Resolving Mechanisms of toxicity while pursuing ecotoxicological relevance. *Mar. Pollut. Bull.* In Press

Volz, D.C., **Bencic, D.C.**, Hinton, D.E., Law, J.M., and S.W. Kullman. 2005. 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) induces organ-specific differential gene expression in male Japanese medaka (*Oryzias latipes*). *Toxicol. Sci.* 85, 572-584.

Wendling, N.C., **Bencic, D.C.**, Nagler, J.J., Cloud, J.G., and R.L. Ingermann. 2004. Adenosine triphosphate (ATP) levels in steelhead (*Oncorhynchus mykiss*) eggs: an examination of turnover, localization, and role. *Comp. Biochem. Physiol. A Mol. Integr. Physiol.* 137, 739-748.

Liu, Z., Kullman, S.W., **Bencic, D.C.**, Torten, M., and D.E. Hinton. 2003. ras oncogene mutations in diethylnitrosamine-induced hepatic tumors in medaka (*Oryzias latipes*), a teleost fish. *Mutat. Res.* 539, 43-53.

Alekseev, O.M., **Bencic, D.C.**, Richardson, R.T., Widgren, E.E., and M.G. O'Rand. 2003. Overexpression of the Linker histone-binding protein tNASP affects progression through the cell cycle. *J. Biol. Chem.* 278, 8846-8852.

Ingermann, R.L., **Bencic, D.C.**, and P. Verrell. 2002. Methoxychlor alters the predator-prey relationship between dragonfly naiads and salamander larvae. *Bull Environ. Contam. Toxicol.* 68, 771-778.

Ingermann, R.L., **Bencic, D.C.**, and J.G. Cloud. 2002. Low seminal plasma buffering capacity corresponds to high pH sensitivity of sperm motility in salmonids. *Fish Physiol. Biochem.* 24, 299-307.

Richardson, R.T., **Bencic, D.C.**, and M.G. O'Rand. 2001. Comparison of mouse and human *NASP* genes and expression in human transformed and tumor cell lines. *Gene* 274, 67-75.

Bencic, D.C., Ingermann, R.L., and J.G. Cloud. 2001. Does CO₂ enhance short-term storage success of chinook salmon (*Oncorhynchus tshawytscha*) milt? *Theriogenology* 56, 157-166.

Bencic, D.C., Cloud, J.G., and R.L. Ingermann. 2000. Carbon Dioxide reversibly inhibits sperm motility and fertilizing ability in steelhead (*Oncorhynchus mykiss*). *Fish Physiol. Biochem.* 23, 275-281.

NARRATIVE

Currently, I am working on a Computational Toxicology project entitled “Linkage of Exposure and Effects Using Genomics, Proteomics, and Metabonomics in Small Fish Models.” I serve as the NERL lead for the project as well as participating in the transcriptomic (microarray and QPCR) and proteomic (2-D PAGE) research using fathead minnow (*Pimephales*, FHM) and zebrafish (*Danio rerio*). A second project I am involved with is the validation and standardization of a FHM oligonucleotide-based microarray as part of a CRADA with the U.S. EPA/NHEERL/MED in Duluth, MN and Eco-Array, LLC in FL. We are testing one custom platform and comparing the results with a different one tested by EcoArray, using the same source of RNA. I am also part of a group that is using 2-D PAGE, and specifically the CyDye-based DIGE, followed by mass spectrometry to identify indicators of exposure to various pesticides and pesticide mixtures.

BIOGRAPHICAL SKETCH

NAME: Richard Bennett

POSITION TITLE: Research Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Michigan State University	B.S.	1976	Zoology
Michigan State University	M.S.	1979	Wildlife Biology
Iowa State University	Ph.D.	1983	Animal Ecology

PROFESSIONAL EXPERIENCE

1999-Present Research Toxicologist, USEPA, ORD, NHEERL, MED, Duluth, MN
1995-1999 Senior Wildlife Toxicologist, ecological planning and toxicology, inc.
1985-1994 Research Ecologist, USEPA, ORD, Corvallis, OR
1983-1985 NRC Postdoctoral Associate, USEPA, ORD, Corvallis, OR

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Environmental Toxicology and Chemistry (Editorial Board 1999-2001)
The Wildlife Society

SELECTED AWARDS AND HONORS

U.S. EPA ORD Bronze Medal for contributions on OECD Expert Panels, 2004
U.S. EPA ORD Bronze Medal for support to Endocrine Disruptor Screening Program, 2004
OPP Special Achievement Award, U.S. EPA Office of Pesticide Programs, 1991
Outstanding Publication Award, USDA, Denver Wildlife Research Center, 1990
ORD Scientific and Technological Achievement Award, Level II, U.S. EPA, 1990
ORD Scientific and Technological Achievement Award, Level III, U.S. EPA, 1989

INVITED LECTURES/SYMPOSIA

Touart, L. and R. Bennett. Validation of an avian two-generation reproduction test: U.S. initiatives. 12th Annual SETAC Europe Meeting, Vienna, Austria, May, 2002.
Leopold, A., R. Bennett, T. Springer and K. Brugger. Development of a test system to evaluate endocrine effects in birds. 12th Annual SETAC Europe Meeting, Vienna, Austria, May, 2002.
Clark, J., A. Fairbrother, L. Brewer and R. S. Bennett. Effects of exogenous estrogen on mate selection of house finches. 12th Annual SETAC Europe Meeting, Vienna, Austria, May, 2002.
Bennett, R. S., K. Brugger, M. A. Ottinger, and L. Touart. Review of issues and objectives for developing an avian endocrine testing protocol. 4th SETAC World Congress, Portland, Oregon, November, 2004.
Bennett, R. S. and T. R. Henry. Approaches for developing tissue-based criteria for protection of wildlife. The Wildlife Society 12th Annual Conference, Madison, WI, September, 2005.
Bennett, R. S., P. H. Albers, M. T. Koterba, R. Rossmann, J. B. French, W. C. Bauer, and K. G. Sappington. Effects of methylmercury on reproduction in American kestrels and comparison to effects observed in other avian species. SETAC 27th Annual Meeting, Montreal, Quebec, Canada, November, 2006.
Nichols, J. W., R. S. Bennett, R. Rossmann, J. B. French, and K. G. Sappington. A combined physiological and bioenergetics-based model for methylmercury in female American kestrels. SETAC 27th Annual Meeting, Montreal, Quebec, Canada, November, 2006.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Member of the Avian Effects Dialogue Group sponsored by RESOLVE, World Wildlife Fund, 1991-1993
Member of OECD Working Group on Avian Reproduction Testing, 1997-Present

Co-chair of the Ecological Committee on FIFRA Risk Assessment Methods (ECOFRAM) sponsored by EPA Office of Pesticide Programs, 1997-1998
Affiliated Faculty, Huxley College of Environmental Studies, Western Washington Univ., Bellingham, 1989-1991
Courtesy Appointment as Associate Professor, Department of Fisheries and Wildlife, Oregon State Univ., 1991-1999
Invited participant to workshop to improve methods for wildlife risk assessment sponsored by the Department of Environment, Food & Rural Affairs, United Kingdom, 2004
Member of Science Advisory Board of The Institute of Environmental and Human Health, Texas Tech University, 2000-2005
Member of Technical Advisory Board for Metropolitan Mosquito Control Board, 2005-Present

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Steering committee for Region/ORD Workshop on Aquatic Life Criteria, Seattle, 2001
Member of interagency workgroup evaluating the protectiveness of the human health criterion for methylmercury to threatened and endangered wildlife species in California, 2002-2003
Co-chair of the Tissue-based Criteria Subcommittee of an interagency Aquatic Life Criteria Guidelines Committee for Office of Water, 2004-Present
Member of the Interagency Technical Team of the California Selenium Wildlife Criteria Development Project, 2005-Present.

PUBLICATIONS

Nacci, D., M. Pelletier, J. Lake, R. Bennett, J. Nichols, R. Haebler, J. Gear, A. Kuhn, J. Copeland, M. Nicholson, S. Walters, and W. R. Munns Jr. 2005. An approach to predict risks to wildlife populations from mercury and other stressors. *Ecotoxicology* 14: 283-293.

Etterson, M. A. and R. S. Bennett. 2005. Including transition probabilities in nest survival estimation: A Mayfield Markov Chain. *Ecology* 86(6): 1414-1421.

Bennett, R. S., I. C. Dewhurst, A. Fairbrother, A. D. M. Hart, M. J. Hooper, A. Leopold, P. Mineau, S. R. Mortensen, R. F. Shore, and T. A. Springer. 2005. A new interpretation of avian and mammalian reproduction toxicity test data in ecological risk assessment. *Ecotoxicology* 14(8): 801-815.

Shore, R. F., D. R. Crocker, H. R. Akcakaya, R. S. Bennett, et al. 2005. Case study 1. How to calculate appropriate deterministic long-term toxicity to exposure ratios (TERs) for birds and mammals. *Ecotoxicology* 14(8): 877-893.

Roelofs, W., D. R. Crocker, R.F. Shore, D. R. J. Moore, G. C. Smith, H.R. Akcakaya, R. S. Bennett, et al. 2005. Case study Part 2: Probabilistic modeling of long-term effects of pesticides on individual breeding success in birds and mammals. *Ecotoxicology* 14(8): 895-923.

Vyas, N. B., J. W. Spann, C. S. Hulse, S. L. Borges, R. S. Bennett, M. Torrez, B. I. Williams, and R. Leffel. 2006. Field evaluation of an avian risk assessment model. *Environmental Toxicology and Chemistry* 25(7): 1762-1771.

Bennett, R. S. and M. A. Etterson. 2006. Estimating pesticide effects on fecundity rates of wild birds using current laboratory reproduction tests. *Human and Ecological Risk Assessment* 12(4): 762-781.

Etterson, M. A. and R. S. Bennett. 2006. Optimal allocation of nest-visitation for estimating stage-specific nest survival rates. *Ecological Modeling* (in press).

Etterson, M. A. and R. S. Bennett. 2006. On the use of published demographic data for population-level risk assessment in birds. *Human and Ecological Risk Assessment* 12(6): 1074-1093.

BIOGRAPHICAL SKETCH

NAME: Norman Birchfield

POSITION TITLE: Senior Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of California Santa Cruz	B.A.	1990	Biochemistry and Molecular Biology
University of California Berkeley	Ph.D.	1996	Environmental Chemistry

PROFESSIONAL EXPERIENCE

2003 - present : **Senior Biologist**

US Environmental Protection Agency

Environmental Fate and Effects Division

Office of Pesticide Programs

Office of Prevention, Pesticides and Toxic Substances

Arlington, VA

2001 - 2003 : **Risk Assessment Process Leader**

US Environmental Protection Agency

Environmental Fate and Effects Division

Office of Pesticide Programs

Office of Prevention, Pesticides and Toxic Substances

Arlington, VA

1997 - 2001: **Chemist / Biologist**

US Environmental Protection Agency

Environmental Fate and Effects Division

Office of Pesticide Programs

Office of Prevention, Pesticides and Toxic Substances

Arlington, VA

1992-1997 : **Postdoctoral / Graduate Research Assistant**

University of California, Berkeley

Environmental Chemistry and Toxicology Laboratory

University of California

Berkeley, California

1990-1992 : **Analytical Chemist**

ToxScan, Incorporated

Watsonville, California

1992-1993 : Continued service for ToxScan, Incorporated on consultant basis. Mass spectrometric analysis and installation of a central-integrated computer data collection system.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

1994 - present: American Chemical Society

Agrochemicals & Chemical Toxicology Divisions

2000 - present: Society for Environmental Toxicology and Chemistry

2004 - present: Association of Applied Biologists

Reviewer for *Forest Ecology and Management*

SELECTED AWARDS AND HONORS

2004: EPA Bronze Medal (for technical support in lawsuit response)

2003: EPA Gold Medal (for technical support in lawsuit response)

2001: Office of Pesticide Programs Chuck Trichilo Award for High Quality and Exemplary Service

1997: First-Place Winner American Chemical Society Agrochemicals Division Young Scientist Predoctoral Research Award

INVITED LECTURES/SYMPOSIA

Birchfield, N.B. (2004). Technical and Regulatory Perspectives for Mosquito Control Practices and Product Labeling. International Drift Conference. Kona, HI.

Institute for Liquid Atomization and Spray Systems Annual Meeting (2004). Invited keynote speaker. Defining Droplet Size Under Application Conditions: Implications for Regulatory Risk Assessment. Arlington, VA.

Hardi Application Technology Course (2001). Estimation of Pesticide Spray Drift Deposition: Regulatory Implications. (Invited Presentation). Copenhagen Denmark.

American Phytopathological Society (2000). Estimation of Pesticide Spray Drift Deposition: Implications for Non-Target Plants (Invited presentation). New Orleans, LA.

National Coalition on Drift Minimization (1999). Pesticide Spray Drift in OPP Risk Assessments. Reno NV.

National Agricultural Aviation Association (1999). The AgDRIFT Model and Environmental Risk Assessment. Roslyn, VA.

Spray Nozzle Manufacturer Workshop (1999). Risk Assessment in the Environmental Fate and Effects Division. Tampa, FL.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Society for Environmental Toxicology and Chemistry (2000 and 2001). Session co-chair for Atmospheric Transport of Pesticides. Nashville, TN and Baltimore, MD.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

FIFRA Scientific Advisory Panel (2000). Consultation: National Drinking Water Survey Design for Assessing Chronic Exposure. Crystal City, VA.

FIFRA Scientific Advisory Panel (1999). Downwind Deposition Tolerance Bounds for Ground Hydraulic Boom Sprayers and Downwind Deposition Tolerance Bounds for Orchards. Crystal City, VA.

OPP Health Effects Division Risk Assessment Review Committee, member

OPP Health Effects Division Metabolism Assessment Review Committee, member

OPP Environmental Fate and Effects Division Review Panel, member

Currently on detail to EPA Science Policy Council Staff

PUBLICATIONS

Birchfield, N.B. Pesticide spray drift and ecological risk assessment in the U.S. EPA: A comparison between current default spray drift deposition levels and AgDRIFT predictions in screening-level risk assessments. (2004) *Aspects of Applied Biology* 71:125-131.

Blomquist, J.D., J.M. Denis, J. Cowles, J.A. Hetrick, R.D. Jones, and N.B. Birchfield. Pesticides in Selected Water-Supply Reservoirs and Finished Drinking Water, 1999-2000: Summary of Results from a Pilot Monitoring Program (2001). US Geological Survey Open-File Report 01-456.

Birchfield, N. B., B. Latli, and J.E.Casida. Human Protoporphyrinogen Oxidase: Relation Between the Herbicide Binding Site and the Flavin Cofactor. (1998) *Biochemistry* 37, 6905-6910.

BIOGRAPHICAL SKETCH

NAME: Sandra Bird

POSITION TITLE: Environmental Engineer

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Univ. of North Carolina @ Chapel Hill	B.A.	1974	Botany
Univ. of Texas @ Austin	M.S.	1980	Chemistry
Univ. of Texas @ Austin	M.A.	1984	Civil Engineering

PROFESSIONAL EXPERIENCE

1989 - present: Environmental Engineer, Ecosystems Research Division, Athens, GA
1988 - 1989: Environmental Engineer, ASCI Corporation, Athens, GA
1984 - 1988: Hydraulic Engineer, U.S. Army Corps of Engineers, Vicksburg, MS
1979 - 1983: Chemistry Instructor, Austin Community College, Austin, TX
1978 - 1979: Biochemistry Research Technician, University of Texas, Austin, TX
1974 - 1978: Chemistry Teaching Assistant, University of Texas, Austin, TX

SELECTED AWARDS AND HONORS

EPA Level 3 STAA Award (2003)
EPA Exceptional ORD Technical Assistance to the Regions or Program Offices (2002)
EPA James Ackerman Award for Ecological Effects Risk Assessment (1999)
EPA Honorable Mention STAA Award (1997)

PUBLICATIONS

Allwine, K.J., F.C. Rutz, J. Droppo, S.L. Bird, and H.T. Thistle. 2005. SPRAYTRAN User's Guide: A GIS-Based Atmospheric Spray Droplet Dispersion Modeling System. U.S. Environmental Protection Agency, Athens, GA. Publication No. [EPA/600/R-05/109](#) (PDF, 109 pp., 2 MB).

Exum, L., R., S. L. Bird, J. Harrison, and C. A. Perkins. 2005. Estimating and Projecting Impervious Cover in the Southeastern United States. U.S. Environmental Protection Agency, Washington, DC, [EPA/600/R-05/061](#).

Wainger, L. A., D. M. King, S. L. Bird and J. A. Cantrell. 2004. Indicators for Assessing Economic Vulnerabilities to Changes in Ecosystem Services: Case Study of Counties in Maryland, USA. *Environmental Management* 34(5):730-747.

Jackson L.E., S.L.Bird, R.W. Matheny, R.V. O'Neill, D. White, K. C. Boesch, J.L. Koviach. 2004. A Regional Approach To Projecting Land-Use Change and Resulting Ecological Vulnerability. *Environ. Monit. Assess.* 94(1-3):231-248

Bird, S.L. 2003. "[Using Canines in Source Detection of Indoor Air Pollutants.](#)" Indoor Air Quality Problems and Engineering Solutions, Air and Waste Management Association, July 21-13, 2003, RTP, NC.

Bird, S., J. Harrison, L. Exum, S. Alberty and C. Perkins. 2002. [Screening to Identify and Prevent Urban Storm Water Problems: Estimating Impervious Area Accurately and Inexpensively.](#) In Proceedings for National Water Quality Monitoring Conference, May 20-23, 2002, Madison, WI.

Bird, S.L., S.G. Perry, S.L. Ray, and M.E. Teske. 2002. "Evaluation of the AGDISP Aerial Spray Drift Algorithms in the AgDRIFT® Model." *Environmental Toxicology and Chemistry*. 21(3):672-681.

Teske, M.E., S.L. Bird, D.M. Esterly, T.B. Curbishley, S.L. Ray, and S.G. Perry. 2002. "AgDRIFT®: A Model for Estimating Near-Field Spray Drift from Aerial Applications." *Environmental Toxicology and Chemistry*. 21(3):659-671.

Bird, S.L., L.R. Exum, and S.W. Alberty. 2000. "Generating High Quality Impervious Cover Data". *Quality Assurance*. 8(2):91-103.

NARRATIVE

My recent research efforts at the USEPA have been in three distinct areas. (1) modeling the drift and deposition of pesticide from agricultural spray operations; (2) evaluating and projecting land use and land cover; and (3) the use of dogs in source detection of pollution. Spray drift modeling initially focused on the use of detailed equipment models in assessment of near-field drift. Recent efforts include the linkage of near-field equipment models to a meso-scale (small watershed or community scale) drift modeling system. Field study evaluations focus on the hand-off between the test near-field models and the agency accepted longer range air transport model (CALMET/CALPUFF). Land use research has focused on estimation and projection of impervious cover for watershed in the southeast. A small in house program was focused on evaluating the viability of using scent detection dogs in screening analysis for vapor intrusion of petroleum components from underground storage tanks and spills.

BIOGRAPHICAL SKETCH

NAME: Bryan Boulanger

POSITION TITLE: Environmental Engineer

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Connecticut	B.S.	1998	Civil and Environmental Engineering
University of Connecticut	B.A.	1998	German
University of Connecticut	M.S.	2000	Environmental Engineering
University of Iowa	Ph.D.	2004	Environmental Engineering

PROFESSIONAL EXPERIENCE

Sept 2005 – Present Federal Post Doctoral Researcher – EPA/ORD
Dec 2004 - Sept 2005 National Academy of Science – NRC Associateship at EPA/ORD

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

International Association of Great Lakes Research
Chi Epsilon Civil Engineering Honor Society, President Connecticut Chapter 1997-1998
Engineers for a Sustainable World

SELECTED AWARDS AND HONORS

2006 Bronze Medal for Commendable Service, US EPA
2004 Top Poster Award – Gordon Research Conference – Environmental Sciences: Water
1998 Eurotech Tuition Scholarship, University of Connecticut
1994 United States Information Agency Educational Grant Recipient

INVITED LECTURES/SYMPOSIA

Boulanger, B. and K.C. Hornbuckle. International Joint Commission – June 2005 Great Lakes Conference and Kingston Biennial Meeting. New Chemical Risks Workshop. “Fluorinated Surfactants in the Environment – Today, Yesterday, and Tomorrow”.

Boulanger, B. EPA Perfluoroalkyl Acids Workshop. July 2006. Research Triangle Park, Durham, NC. “PFAA Degradation, Fate, and Transport.”

Boulanger, B. and Mills, M. STAR Program Review Workshop. July 2006. Research Triangle Park, Durham, NC. “Risk Management Research on Endocrine Disrupting Chemicals”

Boulanger, B., Hornbuckle, K.C., and Schnoor, J.L. September 2004. “Perfluorinated Surfactants in the Great Lakes”. University of Iowa Environmental Engineering Seminar.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Identification of wastewater treatment systems as an important source of perfluorinated compounds to the aquatic environment

First identification of five new perfluoroalkyl compounds in the Great Lakes aquatic system

First publication of residual levels of a consumer product

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Leading agencies exploration of the potential degradation of perfluorinated industrial and commercial products during wastewater treatment

Co-coordinator for the EPA/ORD wide PFOA workgroup

PUBLICATIONS

Boulanger, B., Vargo, J., Schnoor, J.L., and Hornbuckle, K.C. 2005. "Evaluation of Perfluorooctane Surfactants in a Wastewater Treatment System and in a Commercial Surface Protection Product." *Environmental Science and Technology* 39(15):5524-5530

Boulanger, B., Peck, A.M., Schnoor, J.L., Hornbuckle, K.C. 2005. "Response: Mass Budget of Perfluorooctane Surfactants in Lake Ontario." *Environmental Science and Technology* 39(10):3885-3886

Boulanger, B., Peck, A., Schnoor, J.L., and Hornbuckle, K.C. 2005. "Mass Budget of Perfluorooctane Surfactants in Lake Ontario." *Environmental Science and Technology* 39(1):74-79

Boulanger, B., Vargo, J., Schnoor, J.L., and Hornbuckle, K.C. 2004. "Detection of Perfluorooctane Surfactants in Great Lakes Water." *Environmental Science and Technology* 38(15):4064-4070

Boulanger, B. and Nikolaidis, N.P. 2003. "Mobility and Aquatic Toxicity of Copper in an Urban Watershed." *Journal of the American Water Resources Association*. 39(2):325-336

Boulanger, B. and Nikolaidis, N.P. 2003. "Modeling Framework for Managing Copper Runoff in Urban Watersheds." *Journal of the American Water Resources Association*. 39(2):337-345

Michels, H.T., **Boulanger, B.**, and Nikolaidis, N.P. 2003. "Environmental Impact of Stormwater Runoff from a Copper Roof." *Materials Performance*. 42(2):70-74

Michels, H.T., **Boulanger, B.**, and Nikolaidis, N.P. "Copper Roof Stormwater Runoff – Corrosion and the Environment." In *Corrosion 2002*, Paper 02225, NACE International, Houston, Texas

Boulanger, B., Nikolaidis, N.P., and Garrick, N.W. 2001. "Use of X-ray Fluorescence Spectroscopy to Detect Residual Chlorine in Road Salt Deicer Samples." *Applied Spectroscopy*. 55(11):1568-1571

Boulanger, B., Nikolaidis, N.P., Carely, R., and Perkins, C. "Evaluation of the Hydrologic and Chemical Mass Balances of Copper Within an Urban Watershed." In *Proceedings of the 31st Mid-Atlantic Industrial and Hazardous Waste Conference: Hazardous and Industrial Wastes*, 539-548, ed. Nikolaidis, Erkey and Smets July 1999. Technomic Publishing Company, Lancaster, Pennsylvania

BIOGRAPHICAL SKETCH

NAME: Christal C. Bowman

**POSITION TITLE: Postdoctoral Fellow,
R-Authority**

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
College of William & Mary, Williamsburg, VA.	B.S.	1996	Biology
Tulane University, New Orleans, LA.	Ph.D.	2001	Microbiology and Immunology

PROFESSIONAL EXPERIENCE

U.S. Environmental Protection Agency, Immunotoxicology Branch
Postdoctoral Fellow (R-Authority), August 2004 – Present.
University of North Carolina at Charlotte, Department of Biology
Postdoctoral Research Associate, July 2001 – July 2004.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Association of Immunologists, Trainee member, joined 2001.
American Society for Microbiology, Student member, joined 1997.

SELECTED AWARDS AND HONORS

EPA Bronze Medal for exceptional efforts to coordinate across the Federal sector and scientific community to significantly advance EPA's ability to evaluate the safety of plant incorporated protectants, as part of the ORD Biotechnology Research Program Steering Committee, September 2006.

American Academy of Allergy, Asthma, and Immunology Strategic Training in Allergy Research Travel Award, March 2006.

Sigma Xi Award for Excellence in Research and Presentation by a Graduate Student, Tulane University, 2000.

Louisiana Educational Quality Support Fund Fellowship, Tulane University, 1996-2000.

INVITED LECTURES/SYMPOSIA

Invited speaker, *Salmonella* Induces Cyclooxygenase-2 Mediated Prostaglandin Production *In Vivo* and In Cultured Macrophages and Dendritic Cells. American Association of Immunologists 90th Anniversary Annual Meeting, Denver, CO, 2003.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Speaker/participant, Federal Interagency Workshop on Research and Collaborative Opportunities in Crop-Based Food and Feed Allergies, US Department of Agriculture, 2006.

Lecturer, Immunotoxicology, North Carolina State University, Fall 2005.

Lecturer, Biochemical Toxicology, North Carolina State University, Spring 2005-2006.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Biotechnology Research Team, 2004-2006.

PUBLICATIONS

Christal C. Bowman, John D. Clements. Differential biological and adjuvant activities of cholera toxin and *Escherichia coli* heat-labile enterotoxin hybrids. *Infect Immun.* 2001 Mar;69(3):1528-35.

Christal C. Bowman, Amy Rasley, Susanne L. Tranguch, Ian Marriott. Cultured astrocytes express Toll-like receptors for bacterial products. *Glia.* 2003 Sep;43(3):281-91.

Christal C. Bowman, Kenneth L. Bost. *Salmonella* induces cyclooxygenase-2 mediated prostaglandin production *in vivo* and in cultured macrophages and dendritic cells. *J. Immunol.* 2004 Feb;172(4):2497-75.

Christal C. Bowman, Kenneth L. Bost. Cyclooxygenase-2 inhibition enhances activation of Th1 responses during *Salmonella* infection. *Infect Immun.* Submitted.

NARRATIVE

Research at Tulane University: Engineered, produced, and characterized hybrid bacterial toxins capable of enhancing immune responses to unrelated antigens when administered orally or intranasally (mucosal adjuvants for vaccine use).

Research at the University of North Carolina at Charlotte: Examined the role of inflammatory mediators in the initiation of early immune responses against *Salmonella*. Collaborated on one project involving recognition of bacterial components by immune cells of the brain and another to engineer modified bacterial toxin into soybeans as an adjuvant for oral vaccination of cattle against diarrheal disease.

Research at the U.S. EPA: Currently developing an animal model for food allergy in order to assess the allergenicity and safety of genetically modified pest-protected food crops.

BIOGRAPHICAL SKETCH

NAME: Kerry Bullock

POSITION TITLE: Environmental Engineer

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Trinity University, San Antonio, TX	B.S.	1997	Engineering Science
Georgia Institute of Technology, Atlanta, GA	Ph.D.	2003	Chemical Engineering

PROFESSIONAL EXPERIENCE

U. S. Environmental Protection Agency – Research Triangle Park, NC
Environmental Engineer, September 2003-present

Georgia Institute of Technology - Atlanta, GA
Graduate Research/ Teaching Assistant, September 1997-December 2002

Medtronic, Inc. - Minneapolis, MN
Intern, Environmental Health & Safety Dept., May 1997-June 1997

SAIC, Inc. - San Antonio, TX
Intern, Logistics Division, September 1995-March 1996

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Association for Aerosol Research, Member 2004-present
Air & Waste Management Association, Member 2005-present

INVITED LECTURES/SYMPOSIA

Bullock, Kerry R., Tongfan Sun and Aryn S. Teja, "Henry's Constants of VOCs in Aqueous Salt Solutions - Data and Models," Presented at the AIChE National Meeting, November 2001.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Currently providing assistance to the Office of Pesticide Programs via the ETV/ ESTE program in the area of drift reduction technologies.

PUBLICATIONS

Sun, Tongfan, Kerry R. Bullock and Aryn S. Teja, "Correlation and Prediction of Salt Effects on Vapor-Liquid Equilibrium in Alcohol-Water-Salt Systems," Fluid Phase Equilibria, v. 219 n. 2, pp.257-264 (2004).

Bullock, Kerry R. and Aryn S. Teja, "Henry's Constants of Volatile Organic Compounds in Aqueous Salt Solutions," Industrial & Engineering Chemistry Research, v. 42, pp. 6494-6498 (2003).

Teja, Aryn S., Ankur K. Gupta and Kerry Bullock, "Henry's Constants of Methanol in Aqueous Systems Containing Salts," Fluid Phase Equilibria, v. 185 n. 1-2, pp. 265-274 (2001).

Zhu, J. Y., P. H. Liu, X. S. Chai, K. R. Bullock, and A. S. Teja, "Henry's Law Constant of Methanol in Pulping Spent Liquors," Environmental Science and Technology, v. 34 n. 9, pp. 1742-1746 (2000).

Stevenson, M., K. Bullock, W. Y. Lin and K. Rajeshwar, "Sonolytic Enhancement of the Bactericidal Activity of Irradiated Titanium Dioxide Suspensions in Water, "Research on Chemical Intermediates, v. 23, n. 4, pp. 311-323 (1997).

NARRATIVE

Dr. Bullock joined the EPA in 2003, after receiving a B.S. in Engineering Science from Trinity University and a Ph.D. in Chemical Engineering from the Georgia Institute of Technology. Her current research interests include sampling of fine particulate matter (PM 2.5) and source apportionment modeling.

BIOGRAPHICAL SKETCH

NAME: Connie Burdick

**POSITION TITLE: Geographic Information
Systems Specialist**

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Linfield College, McMinnville, OR	B.S.	1982	Business Management
Oregon State University, Corvallis, OR	M.A.	1987	Interdisciplinary Studies
Oregon State University, Corvallis, OR	M.S.	2003	Environmental Sciences

PROFESSIONAL EXPERIENCE

1988-2002: Program Support Specialist, EPA, Corvallis, OR

1983-1988: Administrative Assistant, Oregon State University, Corvallis, OR

1974-1982: Safety Specialist, Mine Safety & Health Administration, Albany, OR

SELECTED AWARDS AND HONORS

US EPA Scientific and Technological Achievement Award: Level I, 2005

US EPA National Honor Award: Gold Medal, Gene Flow Project Research Team, 2005

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Member, US EPA GIS Workgroup

PUBLICATIONS

Watrud, L.S., E.H. Lee, A. Fairbrother, C. Burdick, J.R. Reichman, M. Bollman, M. Storm, G. King and P.K. Van deWater. 2004. Evidence for landscape-level, pollen-mediated gene flow from genetically modified creeping bentgrass with CP4 EPSPS as a marker. *Proceedings of the National Academy of Sciences* 101(40):14533-14538.

Olszyk, D.M., C.A. Burdick, T.G. Pfleeger, E.H. Lee, and L.S. Watrud. 2004. Assessing the Risks to Non-Target Terrestrial Plants from Herbicides. *J. Agric. Meteorol.* 60(4):221-242.

Lee, E.H., C.A. Burdick, D.M. Olszyk. 2005. GIS-based risk assessment of pesticide drift case study: Fresno County, California. EPA/600/R-05/029

Reichman, J.R., Watrud, L.S., Lee, E.H., Burdick, C.A., Bollman, M.A., Storm, M.J., King, G.A. and Mallory-Smith, C. 2006. Establishment of transgenic herbicide-resistant creeping bentgrass (*Agrostis stolonifera* L.) in non-agronomic habitats. *Molecular Ecology*.

BIOGRAPHICAL SKETCH

NAME: Lawrence A. Burns

POSITION TITLE: Ecologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
New York University	B.A.	1968	Biology
University of North Carolina, Chapel Hill	Ph.D.	1978	Zoology (Ecology)

PROFESSIONAL EXPERIENCE

1977-2005 Ecologist, Ecosystems Assessment Branch, U.S. Environmental Protection Agency, Ecosystems Research Division, National Exposure Research Laboratory

1973-1976 Research Assistant in Ecology, University of Florida, Gainesville, Environmental Engineering Department and Center for Wetlands.

1971-1973 Research Aquatic Biologist, U.S. Environmental Protection Agency, Region IV, Naples, Florida, Field Study Station.

1968-1971 Graduate Research Assistant, University of North Carolina at Chapel Hill, Department of Zoology (Atomic Energy Commission grant).

1969 Visiting Scientist, El Verde Field Station, Puerto Rico Nuclear Center.

PROFESSIONAL SOCIETIES

American Association for the Advancement of Science (AAAS)
American Institute of Biological Sciences (AIBS)
Ecological Society of America (ESA Certified Senior Ecologist, 2002-2006)
International Environmental Modelling and Software Society (iEMSs)
Society of Environmental Toxicology and Chemistry (SETAC)

SELECTED AWARDS AND HONORS

ORD Bronze Medal, 3MRA (Multimedia, Multipathway, Multireceptor Risk Assessment Model) Team, 2005
James Ackerman Award, EPA Office of Pesticide Programs, 2000
Special Act/Service Award, Ecological Risk Assessment Issue Research Plan, EPA, 1992
Special Act Award, Emergency Response to Metam-Sodium Spill, EPA, 1991
Scientific and Technological Achievement Award, "Validation of Exposure Models," EPA, 1985
Civil Service Silver Medal, South Florida Ecological Study, EPA, 1973

INVITED LECTURES/SYMPOSIA

Aquatic and Terrestrial Exposure Models. Presented at Region/ORD Pesticides Workshop, October 31 - November 2, 2000 at Chicago, Illinois.

Aquatic Exposure Assessment Models. Presented at Ecological Program Review/Scientist to Scientist Meeting on Toxics and Pesticide Issues, Washington, D.C., November 1999.

Application of Exams as the Surface Water Module in the HWIR Multimedia Risk Assessment System. (With/Presented by R.B. Ambrose Jr.) 20th Annual SETAC Meeting, November 14-19 1999 at Philadelphia, PA.

Modelling of Agrichemicals in Environmental Compartments – Concepts, Problems, and Solutions. Presented at 14th International Plant Protection Congress, July 25-30 1999 at Jerusalem, Israel.

The Coming Era in Aquatic Ecosystem Modeling. Presented 21 November 1996 at the 17th Annual Meeting of the Society of Environmental Toxicology and Chemistry, 17-21 November at Washington, D. C.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

ORD Representative on Science Sub-Group of Interagency Task Force to Restore the South Florida Ecosystem. 1993-1996. Inter-agency study group formed to evaluate South Florida ecosystem health and recommend restoration measures. Technical meetings of local scientists and resource managers, inter-agency consultative meetings, and public hearings culminated in an analytical report on possible strategies for restoration of the Everglades ecosystem (Science Subgroup. 1996. South Florida Ecosystem Restoration: Scientific Information Needs. Report to the Working Group of the South Florida Ecosystem Restoration Task Force. xxix + 487 pp.).

October 4-6, 1995 – a three-day **Water Quality Modeling Workshop** sponsored by the Global Environmental Research and Training Institute, with Ronald Parker (OPP/EFED regulatory modeling strategies) and John Hutson of Cornell University (LEACHM model)

October 5-7 1994 – **Water Quality Modeling Workshop** sponsored by the Environmental Law Foundation of Vermont, with Ronald Parker (OPP/EFED regulatory modeling) and Ray Griggs of Texas A&M (SWRRB model)

Aquatic Risk Assessment and Mitigation Group for Pesticides. 1993. Organized by SETAC Foundation for Environmental Education. Balanced with representatives from academia, government, industry, and public-interest groups, the Group's mission was to (1) establish an *ad hoc* panel to discuss pesticide risk assessment and mitigation for aquatic ecosystems within the U.S. EPA Office of Pesticide Programs' integrated risk assessment paradigm, and (2) prepare a summary report offering recommendations for technical implementation and use of risk mitigation measures in regulatory risk assessment scenarios (Baker, J. L., A. C. Barefoot, L. E. Beasley, L. A. Burns, et al. 1994. Aquatic Risk Assessment and Mitigation Dialogue Group Final Report: Pesticide Risk Assessment and Mitigation. SETAC Press, Pensacola, Florida. 220 pp.).

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Assistant Laboratory Director for Multi-Media Research, National Exposure Research Laboratory, Office of Research and Development. 2002-2003. Detail to NERL Immediate Office to assist with Laboratory ecological research planning, task reviews, budgeting, and client relations. Served as co-chair of Research Coordination Team Ecology Working Group, which includes representatives from each of ORD's Laboratories and Centers, plus Program Office and Regional representatives. Member of writing team for ORD's Multi-Year Plan for Ecological Research, intended to establish research goals for ecosystem protection and restoration encompassing both ORD and the regulatory branches of the Agency.

ECOFRAM (Ecological Committee on FIFRA Risk Assessment Method). 1997-2000. Organized by EPA's Office of Pesticide Programs, ECOFRAM's participants included scientists from government agencies (EPA, USGS, Florida Bureau of Pesticides, Environment Canada, UK MAFF), the pesticide industry, academia, consulting firms, and non-governmental organizations. The mission of ECOFRAM was to develop and recommend tools and processes for improving the quantification of the magnitude, probability, and uncertainty of ecological risks from the use of pesticide products. ECOFRAM results have been reported at technical sessions of the Society of Environmental Toxicology and Chemistry (SETAC) and are the basis for current OPP efforts to implement probabilistic risk assessment methods for FIFRA.

Final site selection review team for National Environmental Statistics Research Center. 1996. At the request of the ORD Executive Council, an ORD-wide team was selected to conduct reviews and site visits of the finalists proposing to form the National Center of Environmental Research and Quality Assurance's National Environmental Statistics Research Center. Site visits were conducted at the National Institute of Statistical Sciences (RTP, NC) and at the University of Washington in Seattle, and an award recommendation made to the Director, NCERQA.

Risk Integration Methods. 1992-1994. Chair of EPA Work Group responsible for guiding development and review of an "issue paper" highlighting important principles and approaches to characterizing ecological risk by integration

of exposure and effects data. The resulting analysis was published at EPA/630/R-94/009, Ecological Risk Assessment Issue Papers.

PUBLICATIONS

- L. A. Burns. 2006. Fate Modeling. In: G. M. Rand (Ed.) Fundamentals of Aquatic Toxicology: Effects, Environmental Fate and Risk Assessment (3rd Edition). Taylor & Francis, Bristol, Pennsylvania.
- Evaluation of three watershed-scale pesticide fate and transport models. 2006. Parker, R., J.G. Arnold, L. A. Burns, L. Carrubba, C. Crawford, S.L. Neitch, N.J. Snyder, R. Srinivasan, and W.M. Williams. Journal of the American Water Resources Association (in review)
- Burns, L. A. 2006. User Manual for EXPRESS, the EXAMS/PRZM Exposure Simulation Shell. EPA/600/R-06/nnn. U.S. Environmental Protection Agency, National Exposure Research Laboratory, Ecosystems Research Division, Athens, Georgia. 37 pp.
- Ronald Parker, J.G. Arnold, Michael Barrett, Lawrence Burns, Lee Carrubba, Charles Crawford, S.L. Neitsch, N.J. Snyder, and R. Srinivasan. 2006. Evaluation of three watershed-scale pesticide environmental transport and fate models. Journal of the American Water Resources Association (in review)
- Burns, L.A. 2001. Probabilistic Aquatic Exposure Assessment for Pesticides. I: Foundations. EPA/600/R-01/071. U.S. Environmental Protection Agency, National Exposure Research Laboratory, Ecosystems Research Division, Athens, Georgia. 43 pp.
- Burns, L. A. 2000. Exposure Analysis Modeling System (EXAMS): User Manual and System Documentation. EPA/600/R-00/081. U.S. Environmental Protection Agency, National Exposure Research Laboratory, Ecosystems Research Division, Athens, Georgia. 197 pp.

BIOGRAPHICAL SKETCH

NAME: Gloria Callard

POSITION TITLE: Professor of Biology

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Tufts University, Medford MA	B.S.	1959	Biology
Rutgers University, New Brunswick NJ	M.S.	1962	Zoology, Physiology
Rutgers University, New Brunswick NJ	Ph.D.	1964	Zoology, Physiology

PROFESSIONAL EXPERIENCE

Professor of Biology, Boston Univ. ('86-present); Res. Assoc./Asst. Prof., Obst.Gyn., Harvard Medical School/Lab. of Human Reprod. & Reprod. Biol.; ('79-82); Asst. Prof., Biology, Tufts Univ., ('72-74); Lecturer, Biology, William & Mary ('67-71); Endocrine Biochemist, Personal Prod. Div., Johnson & Johnson ('65-67); Milltown N.J; Res. Assoc., Zoology, Rutgers Univ.('63-64).

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

AAAS, elected Council Delegate, Bio Sci Electorate ('92-95); Mt Desert Isl Biol Lab, Exec Comm ('87-95), Member, Center for Membrane Toxicity Studies ('95-03); Endocrine Soc. (Student Affairs Comm. '97- 00); Edit Brd: Steroids ('86-'01); Gen Comp Endocr ('85-94); Co-Ed, J Exp Zool, Endocr. Div. ('86-06); Elected Member, Council, International Federation of Comparative Endocrine Societies (2005 – present).

SELECTED AWARDS AND HONORS

B.S. magna cum laude ('59); Phi Beta Kappa ('58); Fulbright Scholar, U.K.('60-61); NSF Predoctoral Fellow ('61-63); elected Fellow, AAAS ('82), Boston Univ Teacher-Scholar of the Year ('86).

INVITED LECTURES

Harvard Medical School/Massachusetts General Hospital, Pediatric Endocrinology (1/01)
Washington University School of Medicine, St. Louis, Pharmacology & Physiological Sci. (4/02)
Swiss Federal Inst. for Environ. Sci. & Technol. (EAWAG), Environmental Microbiology & Ecotoxicology Department, Dubendorf (Zurich), June '02.

Mount Desert Island Biological Laboratory (7/03)
Dept. of Toxicology, University of Connecticut (4/05)
Great Lakes Water Institute, University to Wisconsin, Milwaukee (5/05)
Biology Department, University of Massachusetts Boston (4/06)

INVITED SYMPOSIA

Cyp19 (Aromatase) and Estrogen Receptor Genes in Zebrafish, 8th Annual Mount Desert Island Biological Laboratory Environmental Health Sciences Symposium on Intracellular Sensors of Environmental Chemicals, Bar Harbor ME, July 2001.
Environmental Chemicals Differentially Induce Expression of Brain and Ovarian *Cyp19* (Aromatase) Genes in Zebrafish Embryos. Superfund Basic Research Program Annual Meeting, Assessing Risks of Hormonally Active Agents, Gainesville FL, December 2001.
Polymerase chain reaction-differential display (PCR-DD) identifies a subset of stage-dependent and toxicant regulated genes during spermatogenesis: the shark testis model. EPA Endocrine Disruptors Workshop, Research Triangle Park, October 2003.
Regulation and dysregulation of aromatase and estrogen receptor genes in fishes. State of the art lecture. 5th Int Fish Endocrinol Symp., Castellon Spain, September 2004.
Regulation and Dysregulation of Aromatase and Estrogen Receptor Genes in Fishes. Endocrine Disruptors

Symposium, 15th International Symposium on Comparative Endocrinology, Boston, May 2005.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Advisory Panel Member: NSF (Reg Biol '83-86) and NSF Oversight Committee (Reg Biol '89); ad hoc member, NIH Biochemical Endocrinology Study Section (87, 88); Member, NIEHS Site Visit Committee, Program Project, 2000; Member, NIEHS (Superfund) Special Study Section (2005); Member, International Organizing Committee, 15th International Congress of Comparative Endocrinology, Boston, 2005; Elected Member, Council, International Federation of Comparative Endocrine Societies (2005 – present)

PUBLICATIONS

Publications represent 20 out of a total of 23 for the period 1998-2006 and 155 total publications.

1. Gelinias D, Pitoc GA, Callard GV 1998. Isolation of goldfish brain P450 aromatase cDNA and analysis of expression during the reproductive cycle and after steroid treatment in vivo. *Mol Cell Endocrinol* 138:81-93.
2. Tchoudakova A, Callard GV 1998. Identification of multiple CYP19 genes encoding different cytochrome P450 aromatase isozymes in brain and ovary. *Endocrinology* 139:2179-2189.
3. Callard GV, McClusky L, Betka M. 1998. Apoptosis as a normal mechanism of growth control and target of toxicant actions during spermatogenesis: insights using the shark testis model. In: New Developments in Marine Biotechnology, LeGal Y, Halvorson H (eds), Plenum. pp. 125-128.
4. Callard GV, and Callard IP 1999. Spermatogenesis in subavian vertebrates. In: Encyclopedia of Reproduction (eds., Knobil E., and Neill, J.), Vol 4, Academic Press, pp. 563-570.
5. Betka M, and Callard GV 1999. Stage-dependent accumulation of cadmium and induction of metallothionein-like binding activity in the testis of the dogfish shark *Squalus acanthias*. *Biol Reprod* 60:147-157.
6. Tchoudakova A, Pathak S, and Callard GV 1999. Molecular cloning of an estrogen receptor β -subtype from the goldfish, *Carassius auratus*. *Gen Comp Endocrinol* 113:388-400.
7. Kishida M, Tchoudakova A, Miller D, and Callard GV 1999. Analysis of the goldfish (*Carassius auratus*) aromatase (P450arom) gene promoter by green fluorescent protein (GFP) expression in living zebrafish (*Danio rerio*) embryos. *The Bulletin, Mount Desert Island Biological Laboratory* 38: 37-38.
8. Betka M, Welenc A, Franks DG, Hahn ME, Callard GV. 2000. Characterization of two aryl hydrocarbon receptor (AHR) mRNA forms in *Squalus acanthias* and stage-dependent expression during spermatogenesis. *The Bulletin, Mount Desert Island Biological Laboratory* 39:110-112.
9. Kishida M, Callard GV. 2001. Distinct cytochrome P450 aromatase isoforms in zebrafish (*Danio rerio*) brain and ovary are differentially programmed and estrogen regulated during early development. *Endocrinology* 142:740-750.
10. Zhao J, Tchoudakova A, Callard G, Chen S (2001). Different catalytic properties and inhibitor responses of the goldfish brain and ovary cytochrome P450 aromatase isozymes. *Gen Comp Endocrinol* 123:180-91.
11. Kishida M, McLellan M, Miranda JA, Callard GV (2001). Estrogen and xenoestrogens upregulate the brain aromatase isoform (P450aromB) and perturb markers of early development in zebrafish (*Danio rerio*). *Comp Physiol Biochem* 129/2-3:261-268.
12. Tchoudakova A, Kishida M, Wood E, Callard GV (2001). Promoter characteristics of two *cyp19* genes differentially expressed in the brain and ovary of teleost fish. *J Steroid Biochem Mol Biol* 78/5:427-439.
13. Callard GV, Tchoudakova A, Kishida M, Wood E (2001). Differential tissue distribution, developmental programming, estrogen regulation and promoter characteristics of *cyp19* genes in teleost fish. *J Steroid Biochem Mol Biol* 79:305-314.
14. Wang C, Callard GV (2001). Polymerase chain reaction (PCR)-differential display identifies a subset of stage-dependent and cadmium-regulated genes during spermatogenesis in *Squalus acanthias*. *The Bulletin, Mount Desert Island Biological Laboratory* 40:54-7.
15. Engel, KB, Callard GV (2005). The testis and spermatogenesis. In: Jamieson B, Hamlett W (eds). *Reproductive Biology and Phylogeny of Chondrichthyes: Sharks, Skates and Chimeras*. Science Publishers, Inc., Enfield NH, pp. 171-200.
16. Greytak SR, Champlin D, Callard GV (2005). Isolation and characterization of two cytochrome P450 aromatase forms in killifish (*Fundulus heteroclitus*): differential expression in fish from polluted and unpolluted environments. *Aquatic Toxicol* 71:371-389.
17. Sawyer SJ, Gerstner KA, Callard GV. (2006). Development of a real time PCR assay for cytochrome P450 aromatase isoforms in zebrafish: tissue distribution, sex differences, developmental programming, and estrogen regulation. *Gen Comp Endocrinol* 147(2):108-17.

18. Engel KB, Callard GV. Endocrinology of Leydig Cells in Nonmammalian Vertebrates. In: Payne A, Hardy M (eds), The Leydig Cell in Health and Disease, Humana Press (in press).
19. Tarrant AM, Greytak SR, Callard GV, Hahn ME. (2006) Estrogen receptor-related receptors in the killifish *Fundulus heteroclitus*: diversity, expression and estrogen responsiveness. *Mol Cell Endocrinol* 37:105-120.
20. Greytak SR, Callard GV (2006). Cloning of three estrogen receptors (ER) from killifish (*Fundulus heteroclitus*): Differences in populations from polluted and reference environments. *Gen Comp Endocrinol* 148: 15pp (epub in advance of issue).

BIOGRAPHICAL SKETCH

NAME: Denise Champlin

POSITION TITLE: Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Rhode Island	B.S. M.S. Ph.D.	1972	Animal Science

PROFESSIONAL EXPERIENCE

1987-1989 Biological Technician, US Environmental Protection Agency, Narragansett, RI,
University of Rhode Island Cooperative Agreement
1989-1995 Biologist, Science Applications International Corporation, Technical Support
Contract to US Environmental Protection Agency, Narragansett, RI
1995- Present Research Biologist, US Environmental Protection Agency, Atlantic Ecology
Division (AED), Narragansett, RI

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

New England Estuarine Research Society
Society of Environmental Toxicology and Chemistry, North Atlantic Chapter

SELECTED AWARDS AND HONORS

EPA Scientific and Technical Advancement Award (STAA) for publications, 1998, 1999, 2001, 2002

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Collaborate; provide technical assistance and samples to researchers at EPA, CI and Educational Institutions. These collaborations include Boston University, Woods Hole Oceanographic Institute, University of Rhode Island, Harvard and San Francisco State University.
Served as a Mentor for the Rhode Island State Internship Program and to undergraduate students

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Thursby, G., M. Chintala, D. Stetson, C. Wigand and D. Champlin. A Rapid, Non-Destructive Method for Estimating Aboveground Biomass of Salt Marsh Grasses. 2002. *Wetlands*, Vol.22, (3) 626-630.
Nacci, D., L. Coiro, A. Kuhn, D. Champlin, W.R. Munns, Jr., USA Environmental Protection Agency, Atlantic Ecology Division, Narragansett, RI. J. Specker, University of Rhode Island, Kingston, RI and K. Cooper, Rutgers University, Piscataway, NJ. 1998. A non-destructive indicator of ethoxyresorufin-o-deethylase activity in embryonic fish. *Environmental Toxicology and Chemistry* 17 (12) 2481-2486.

PUBLICATIONS

1. Roark, S. A., M.A. Kelble, D.E Nacci, D. Champlin, L. Coiro and S.I. Guttman. 2005. Population Genetic Structure and Tolerance to Dioxin-Like Compounds of a Migratory Marine Fish *Menidia menidia* at PCB-Contaminated and Reference Sites. *Environmental Toxicology and Chemistry* 24 (3):726-732.
2. Roark, S.A., D.E. Nacci, L. Coiro, D. Champlin, and S.I. Guttman. 2005. Population Genetic Structure of a Non-Migratory Estuarine Fish *Fundulus heteroclitis* Across a Strong Gradient of PCB Contamination. *Environmental Toxicology and chemistry* 24(3):717-725.
3. Nacci, D., E., D. Champlin, L. Coiro, R. McKinney and S. Jayaraman. Predicting the occurrence of Genetic

- Adaptation to Dioxinlike Compounds in Populations of the Estuarine Fish, *Fundulus heteroclitis*. (2002) *Environmental Toxicology and Chemistry* 21 (7): 1525-1532.
4. Thursby, G., M. Chintala, D. Stetson, C. Wigand and D. Champlin. A Rapid, Non-Destructive Method for Estimating Aboveground Biomass of Salt Marsh Grasses. 2002. *Wetlands*, Vol.22, (3) 626-630.
 5. Kuhn, A., W.R. Munns, Jr., D. Champlin, R. McKinney, M. Tagliabue, T. Gleason and J. Serbst. USA Environmental Protection Agency, Atlantic Ecology Division, Narragansett, RI. Evaluation of the Efficacy of Extrapolation Population Modeling to Predict the Dynamics of *Americamysis bahia* Populations in the Laboratory. (2001) *Environmental Toxicology and Chemistry* 20 (1): 213-221
 6. Lussier, S. M., D. Champlin, J. LiVolsi, S. Poucher and R. Pruell. Acute Toxicity of *Para*-nonylphenol to Saltwater Animals. (2000) *Environmental Toxicology and Chemistry* 19 (3):617-621
 7. Kuhn, A., W.R. Munns, Jr., S. Poucher, D. Champlin and S. Lussier. Prediction of Population-level Response from Mysid Toxicity Test Data using Population Modeling Techniques. (2000) *Environmental Toxicology and Chemistry* 19(9):2364-2371
 8. Pechenik, J.A., F. Bernard, T.R. Gleason and D. Champlin. Influence of Lowered Salinity and Elevated Cadmium on the Survival and Metamorphosis of Trochophores in *Capitella* sp. I (2001) *Invertebrate Biology*. 120(2): 142-148.
 9. Pechenik, J.A., T. Gleason, D. Daniels and D. Champlin. Influence of Larval Exposure to Salinity and Cadmium Stress on Juvenile Performance of Two Marine Invertebrates (*Capitella* sp.I and *Crepidula fornicata*). (2001) *Journal of Experimental Marine Biology and Ecology* 264: 101-114.
 10. R.L Spehar, S. Poucher, L. T. Brooke, D.J. Hansen, D. Champlin, D.A. Cox. Comparative Toxicity of Fluoranthene to Freshwater and Saltwater Species under Fluorescent and Ultraviolet Light. (1999) *Environmental Contamination and Toxicology* 37: 496-502.
 11. Nacci, D., L. Coiro, D. Champlin, S. Jayaraman, R. McKinney, T. Gleason, W.R. Munns, Jr., USA Environmental Protection Agency, Atlantic Ecology Division, Narragansett, RI; J. Specker, University of Rhode Island, Kingston, RI and K. Cooper, Rutgers University, Piscataway, NJ. Adaptation of wild fish populations to persistent environmental contaminants. (1999) *Marine Biology* 134: 9-17.
 12. Lussier, S. M., W.S... Boothman, S. Poucher, D. Champlin and A. Helmstetter. Comparison of Dissolved and Total Metals Concentrations from Acute Tests with Saltwater Organisms. 1999 *Environmental Toxicology and Chemistry* 18 (5):889-898. 600/J-99/165
 13. Nacci, D., L. Coiro, A. Kuhn, D. Champlin, W.R. Munns, Jr., USA Environmental Protection Agency, Atlantic Ecology Division, Narragansett, RI. J. Specker, University of Rhode Island, Kingston, RI and K. Cooper, Rutgers University, Piscataway, NJ. 1998. A non-destructive indicator of ethoxyresorufin-o-deethylase activity in embryonic fish. *Environmental Toxicology and Chemistry* 17 (12) 2481-2486. 600/J-99/170

BIOGRAPHICAL SKETCH

NAME: Christina Cinalli

POSITION TITLE: Chemist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Maryland	B.S.	1984	Chemistry

PROFESSIONAL EXPERIENCE

19 years as an Exposure Assessor at the U.S. EPA's Office of Pollution Prevention and Toxics
Industrial Hygienist for three years for Occupation Medical Center, a GSA contractor.
Lab Manager for Advanced Biotechnologies, Bethesda, Maryland
Assistant Lab Manager, Prince George's Community College, Largo, Maryland
Lab Technologist, Ohio Department of Health, Columbus, Ohio

SELECTED AWARDS AND HONORS

U.S. EPA Bronze Medal for Development of DfE Wall Paint Exposure Model in Partnership with Industry

U.S. EPA Bronze Medal in recognition for managing the interagency multi-media risk assessment of dioxin and bleached wood pulp and provided the analytical support needed for EPA's risk management decisions as required by the consent decree.

U.S. EPA Bronze Medal for outstanding technical contribution to EPA's response to the Section 21 Petition on Lead Wheel-Balancing Weights.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Project lead for the Aerosol Spray Paint risk management case.
Co-coordinator for the Indoor Air Source Characterization Project..
Exposure assessor for the New Chemicals Program under the Toxic Substance Control Act
Developing research needs, data and/or models for OPPTS programs including nanotechnology, PFOs and PFOA, consumer exposure, migration of chemicals in polymers, dermal exposure, indoor air, and existing chemicals.

BIOGRAPHICAL SKETCH

NAME: Timothy W. Collette

POSITION TITLE: Research Chemist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Berry College, Rome, GA	B.S.	1981	Chemistry
University of Georgia, Athens, GA	Ph.D.	1985	Physical Chemistry

PROFESSIONAL EXPERIENCE

1985 – Present Research Chemist, Processes and Modeling Branch, Ecosystems Research Division, NERL, U.S. EPA, Athens, GA

1981 – 1985 Teaching Assistant and Research Assistant, Department of Chemistry, University of Georgia, Athens, Ga.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society Membership: American Chemical Society, Society of the Sigma Xi, Coblenz Society, Society of Applied Spectroscopy

Editorial Advisory Board: *Vibrational Spectroscopy*: 1999 - 2005

Advisory Board: *Comprehensive Analytical Chemistry*: 1998 – present

Special Issue Editor: *Vibrational Spectroscopy*: September 2000

Associate Editor: *Vibrational Spectroscopy*: 1995 - 1999

SELECTED AWARDS AND HONORS

Berry College :

1980 Outstanding Undergraduate in Analytical Chemistry Award.

University of Georgia:

1982 Summer Non-Teaching Assistantship Award.

EPA:

1988 Innovative Research Program Proposal Award (Spectroscopy-based Fate Prediction)

1989 – 2004 Eleven Scientific and Technological Achievement Awards

1996 Internal Grant Proposal Award (Organic Chemical Speciation)

2000 – 2004 Three Bronze Medals for Commendable Service

2004 Office of Pollution Prevention and Toxics “Mission Award” (PFOA Workgroup)

2004 Commendation from the Office of Acquisition Management (NMR Purchase)

Outside Awards:

2000 Athens Federal Executives Association Public Service Recognition Award

2001 Sigma Xi Outstanding Research Paper Award (University of Georgia Chapter)

INVITED LECTURES/SYMPOSIA

recent talks selected from a total of 27 since 1989

"Speciation of Complex Organic Contaminants in Water with Raman Spectroscopy" T.W. Collette and T.L. Williams, 30th International Symposium on Environmental Analytical Chemistry, Espoo, FINLAND, June (2000).

“ORD/NERL/ERD’s Chemical Identification and Fate Research Relative to Pesticide and Toxic Chemical Risk Assessments” T.W. Collette and E.J. Weber, U.S. EPA, ORD/OPPTS Seminar Series, Office of Prevention, Pesticides, and Toxic Substances, Washington DC, October (2002).

“Proposal for A Drinking Water Treatment Model - A Screening-Level Tool for Prioritizing Chemicals and Tests”
T.W. Collette, U.S. EPA, Drinking Water Treatment Scientist-to-Scientist Meeting, Washington DC, January
(2004).

“Role of Metabonomics as a Diagnostic Tool for Small Fish Toxicology and Other Applications”, T.W. Collette, D.
Ekman, A.W. Garrison, J.F. Kenneke, T. Whitehead, and Dan Cherney. U.S. EPA, STAR Computational
Toxicology Research Seminar, RTP, NC, July (2005).

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Coordinating Committee: International Symposium on Environmental Analytical Chemistry:
1996 - 2001

Program Committee: SPIE Symposium on Environmental and Industrial Sensing: 1999

Exhibit Chairman: 11th International Conference on Fourier Transform Spectroscopy:
1997

Program Committee: International Symposium on Environmental Analytical Chemistry:
1997, 1999, 2000

Society of the Sigma Xi, University of Georgia Chapter, Admission Committee: 2002 - 2005

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

EPA Cross-ORD Post-doc Recruitment Workgroup: 2005

EPA/ORD Computational Toxicology Implementation and Steering Committee: 2004 - present

EPA/OPPT Telomer Degradation Workgroup 2004 - present

EPA/OPPT PFOA Monitoring Workgroup: 2003 - present

EPA/ORD Safe Pesticides, Safe Products Long Term Goal 3 Workgroup: 2003 - present

EPA/ORD Computational Toxicology Research Initiative Design Team: 2002-2003

PUBLICATIONS

Recent citations selected from a total of 41 peer-reviewed journal publications since 1983:

"Optimization of Raman Spectroscopy for Speciation of Organics in Water," T.W. Collette, T.L. Williams, and J.C.
D'Angelo, *Appl. Spectros.* 55, 750-766 (2001).

"Comparison and Evaluation of Laboratory Performance on a Method for the Determination of Perchlorate in
Fertilizers" E.T. Urbansky and T.W. Collette, *J. Environ. Monitor.* 3, 454-462 (2001).

"Prediction of Molecular Properties with Mid-Infrared Spectra and Interferograms" T. W. Collette, *Appl. Spectros.* 55,
1067-1078 (2001).

"Raman Spectroscopic Analysis of Fertilizers and Plant Tissue for Perchlorate" T.L Williams, R.B. Martin, and T.W.
Collette, *Appl. Spectros.* 55, 967-988 (2001).

"The Role of Raman Spectroscopy in the Analytical Chemistry of Potable Water" T.W. Collette and T.L. Williams, *J.*
Environ. Monitor. 4, 27-34 (2002).

"Analysis of Hydroponic Fertilizer Matrixes for Perchlorate: Comparison of Analytical Techniques " T.W. Collette,
T.L Williams, E.T. Urbansky, M.L. Magnuson, G.N. Hebert, and S.H. Strauss, *Analyst*, 128, 88-97 (2003).

“Computational Toxicology: Framework, Partnerships, and Program Development”, R. Kavlock, G. Ankley, T.
Collette, E. Francis, K. Hammerstrom, J. Fowle, H. Tilson, G. Toth, P. Schmieder, G. D. Veith, E. Weber, D. C. Wolf,
and D. Young, *Reprod. Toxicol.*, 19, 265 - 280 (2005).

“Degradation of Chlorpyrifos in Aqueous Chlorine Solutions: Pathways, Kinetics, and Modeling”, S.E. Duirk and
T.W. Collette, *Environ. Sci. Technol.*, 40, 546 - 551 (2006).

“Monitoring the Speciation of Aqueous Free Chlorine from pH 1 to 12 with Raman Spectroscopy to Determine the Identity of the Potent Low-pH Oxidant”, D.P. Cherney, S.E. Duirk, J.C. Tarr, and T.W. Collette, *Appl. Spectros.*, 60, 764 - 772 (2006).

NARRATIVE

Since joining EPA in 1985, Dr. Collette was engaged in research on the following problems, which are generally listed in chronological order:

- 1) Identification of unsuspected pollutants in environmental samples using GC/IR in concert with GC/MS. This includes identification of the organic byproducts formed when drinking water is treated with disinfectants other than chlorine.
- 2) Development of an IR spectroscopy-based method for the prediction of parameters used for environmental fate assessments (e.g., physical/chemical property constants, equilibrium constants, reaction rate constants).
- 3) Application of Raman spectroscopy for the determination of perchlorate in fertilizers and plant tissues.
- 4) Investigations on the speciation of complex (hydrophilic, polyfunctional, ionizable) organics in water. This includes Raman spectroscopy-based methods for identifying and quantifying chemical species such as tautomers, hydrogen bonded complexes, ions and zwitterions.
- 5) Investigations on the fate of pesticides and toxic chemicals during drinking water treatment. .

Most recently, Dr. Collette is leading a team that conducts research on: a) metabolism that is needed to develop an evaluated metabolic simulator, and b) the application of metabolomics to identify markers of chemicals exposure. In the future, Dr. Collette will utilize the expertise he has acquired over years in chemometrics and spectroscopy to apply metabolomics to chemical exposure studies using small fish models.

BIOGRAPHICAL SKETCH

NAME: Philip M. Cook

POSITION TITLE:

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Tufts University	B.S.	1961	Chemistry
Colorado School of Mines	M.S.	1968	Geochemistry
University of Wisconsin	Ph.D.	1972	Inorganic/Physical Chemistry

PROFESSIONAL EXPERIENCE

1966-1968 Teaching Assistant, NASA Trainee, Colorado School of Mines
1968-1972 Teaching Assistant, NSF Trainee, University of Wisconsin
1972-1974 Technical Case Coordinator, Reserve Mining Case, U.S. EPA
1974-1982 Research Chemist, U.S. EPA, Duluth, MN
1982-1987 Chief of Hazardous Waste Research Branch, U.S. EPA, Duluth, MN
1987-1990 Associate Director for Research Operations, U.S. EPA, Duluth, MN
1990-1992 Special Assistant for Great Lakes Research, U.S. EPA, Duluth, MN
1992-1996 Senior Research Chemist and Dioxin Eco-risk Research Coordinator, U.S. EPA
1996-1998 Acting Chief of Ecological Toxicology Branch, U.S. EPA, Duluth, MN
1998-1999 Senior Research Chemist, U.S. EPA, Duluth, MN
1999-2000 Acting Chief of Ecological Toxicology Branch, U.S. EPA, Duluth, MN
2001-2004 Senior Research Chemist, U.S. EPA, Duluth, MN
2004-2005 Acting Associate Director for Science, U.S. EPA, Duluth, MN
2005- Senior Research Chemist, U.S. EPA, Duluth, MN

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Chemical Society
 Environmental Chemistry Division of ACS
 International Association of Great Lakes Research
 Sigma Xi
 Society of Environmental Toxicology and Chemistry
 Society for Conservation Biology
United States Society for Ecological Economics

SELECTED AWARDS AND HONORS

EPA National Honor Award for Scientific Achievement - 2004
EPA Scientific and Technological Achievement Awards (7)
EPA Silver Medal - 1996 - Great Lakes Water Quality Guidelines
EPA Bronze Medals (5)
Nominated for NSF Alan T. Waterman Award - 1975

INVITED LECTURES/SYMPOSIA

(10 of a total of 29 for the last 5 years)

1. Cook, P.M. 2005. Relative potencies of mineral and synthetic fibers revisited. ASTM Johnson Conference, University of Vermont, July 18-22, 2005.
2. Cook, P.M. 2005. One hundred year history of dioxin in Lake Ontario lake trout. Midwest Regional Chapter of the Society of Toxicology, Chicago, IL, May 13, 2005.

3. Cook, P.M. 2005. Based on current knowledge can we predict the fate and effects of persistent bioaccumulative toxic chemicals in the aquatic environment?, Seminar, Wadsworth Center New York State Department of Health, Albany New York, April 21, 2005.
4. Cook, P.M. 2005. What makes asbestos hazardous? Seminar, Geology Department, University of Minnesota at Duluth, February 24, 2005.
5. Cook, P.M. 2004. Analytical Methods Must and Can Meet the requirements for Assessing Health Risks Associated with Diverse Occurrences of Mineral Fibers, INTER/MICRO - 2004, Chicago, IL, July 12, 2004.
6. Cook, P.M. 2004. Thirty years of debate over risks posed by asbestos and related durable fibers: too ubiquitous, too persistent, too complex to allow an old researcher to rest? Seminar presented to University of Minnesota Natural Resources and Research Institute, Duluth, MN, May 18, 2004.
7. Cook, P.M. 2004. The Reserve Mining Case: Scientific Issues that Created and Transformed
8. the Landmark Case and Still Persist Today, Minnesota State Bar Association Continuing Legal Education Course, Minneapolis, MN, April 23, 2004.
9. Cook, P.M. 2003. Historical effects of dioxins on Lake Ontario lake trout populations, Great Lakes Binational Toxics Strategy Stakeholder Forum, Chicago, IL, December 16, 2003.
10. Cook, P.M. 2003. Asbestos and related durable fibers: too ubiquitous, too persistent, and too complex to put health risks to rest? (Invited re-presentation of August 2003 Emerging Pollutants Workshop presentation), Minnesota Society of Toxicology, Duluth MN, October 29, 2003.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Wisconsin Governor's Committee on the Use of Fish Toxicants, 1970-1973
 Federal Interagency Task Force on the Reserve Mining Case, 1974-1976
 U.S. EPA Asbestos Planning Group and Asbestos Analysis Methods Subcommittee, 1972-1978
 ASTM E-4 Committee on Standard Methods for Analysis of Asbestos Fibers in Water, 1973-80
 Subcommittee to Coordinate Asbestos Research in the U.S. Public Health Service, 1978-1982
 Lake Ontario TCDD Bioaccumulation Study Interagency Work Group, 1986-1990
 Green Bay Mass Balance Study Technical Coordination Committee, 1987-1992
 EPA Dioxin Reassessment Research Planning Group, 1992-1995
 Planning Committee for International Conference on Bioaccumulation, 1991-1993
 Great Lakes Water Quality Initiative Workgroups for Bioaccumulation and Mixtures, 1992-1995
 Lake Michigan Mass Balance Study Technical Coordination Committee, 1993-1996
 SETAC Workshop on the Environmental Risks of Chlorine-containing Chemicals, 1994-1995
 Expert Panel to Advise the Great Lakes Fishery Commission on TFM Lampricide, 1995
 World Health Organization Expert Consultation for Derivation of Toxicity Equivalence Factors, 1997-1998.
 U.S. EPA/DOI Planning Committee for Workshop on Use of Toxicity Equivalence Factors in Ecological Risk Assessments, 1997-1999.
 Assessment & Monitoring Workgroup of the Northeast Forest Resource Committee of the Minnesota Forest Resources Council, 1998-1999.
 United Church of Christ National Environment and Energy Task Force, 2005-present.

PUBLICATIONS

(12 of a total of 20 for the last 8 years)

1. Burkhard, L.P., P.M. Cook, and M.T. Lukasewycz. 2006. Sediment-water column concentration quotients (Q_{socws}): measuring chemical disequilibrium and exploring the impact of black carbon in aquatic ecosystems. Environmental Science & Technology, submitted for publication.
2. Hornung, M.W., P.M. Cook, P.N. Fitzsimmons, D.W. Kuehl, and J.W. Nichols. 2006. Tissue Distribution and Metabolism of Benzo[a]pyrene in Embryonic and Larval Medaka (*Oryzias latipes*). Tox. Sci., submitted for publication.
3. Burkhard, L.P., P.M. Cook, and M.T. Lukasewycz. 2006. A hybrid empirical/modeling approach for extrapolating BSAFs across species, time, and/or ecosystems. Environmental Toxicol. and Chem., 25, 1946-1952.

4. Burkhard, L.P., P.M. Cook, and M.T. Lukasewycz. 2005. Comparison of biota-sediment accumulation factors across ecosystems. *Environmental Science & Technology*, 39, 5716-5721.
5. Burkhard, L.P., P.M. Cook, M.T. Lukasewycz. 2004. Biota-sediment accumulation factors for polychlorinated biphenyls, dibenzo-p-dioxins, and dibenzofurans in southern Lake Michigan lake trout (*salvelinus namaycush*). *Environ. Sci. Technol.*, 38, 5297-5305.
6. Hornung, M.W., P.M. Cook, K.M. Flynn, D.B. Lothenbach, R.D. Johnson, and J.W. Nichols. 2004. Use of multi-photon laser-scanning microscopy to describe the distribution of xenobiotic chemicals in fish early life stages. *Aquatic Toxicology*, 67, 1-11.
7. Cook, P.M., J. Robbins, D.D. Endicott, K. B. Lodge, M.K. Walker, E.W. Zabel, P.D. Guiney, and R.E. Peterson. 2003. Effects of aryl hydrocarbon receptor mediated early life stage toxicity on lake trout populations in Lake Ontario during the 20th century. *Environ. Sci. Technol.*, 37, 3864-3877.
8. Burkhard, L.P., D.D. Endicott, P.M. Cook, Sappington, K.G., and E.L. Winchester. 2003. Evaluation of two methods for prediction of bioaccumulation factors. *Environ. Sci. Technol.*, 37, 4626-4634.
9. Burkhard, L.P., P.M. Cook, and D.R. Mount. 2003. The relationship of bioaccumulative chemicals in water and sediment to residues in fish: a visualization approach. *Environ. Toxicol. Chem.*, 22: 2822-2830.
10. Cook, P.M. and T.R. Henry, 2003. A conceptual model for evaluating relative potency data for use in ecological risk assessments, *Organohalogen Compounds*, 65, 304-307.
11. Cook, P.M. and R.E. Peterson, 2003. Use of the TEQ model for assessing AHR mediated toxicity risks to populations of lake trout and other species in Lake Ontario, *Organohalogen Compounds*, 65, 308-311.
12. Henry, T., P. Cook, P. Cirone, M. DeVito, B. Duncan, R. Pepin, and S. Schwenk. 2003. Framework for application of the toxicity equivalence methodology for polychlorinated dioxins, furans, and biphenyls in ecological risk assessment, *Organohalogen Compounds*, 65, 300-303.

SELECTED REPORTS:

- U.S. EPA. 2006. Framework for the application of the toxicity equivalence methodology for polychlorinated dioxins, furans and biphenyls in ecological risk assessment. Risk Assessment Forum, Washington, DC. In EPA policy review.
- U.S. EPA. 2003. Methodology for deriving ambient water quality criteria for the protection of human health technical support document volume III part I, development of national bioaccumulation factors, Office of Water, Washington, DC. EPA-822-R-03-030.
- U.S. EPA. 2001. Workshop report on the application of 2,3,7,8-TCDD toxicity equivalence factors to fish and wildlife. EPA/630/R-01/002. Risk Assessment Forum, Washington, DC. Available from: www.epa.gov/ncea/raf.

PEER-REVIEWED BOOK CHAPTERS:

- R.J. Erickson, J.W. Nichols, P.M. Cook, and G.T. Ankley. 2006. Bioavailability of chemical contaminants in aquatic systems. In *The Toxicology of Fishes*, eds. R. Di Giulio and D. Hinton, Chapter 2, pp . Macmillan Publishing, New York, NY
- Hornung, M.W., K.M. Flynn, R.D. Johnson, P.M. Cook, and J.W. Nichols. 2004. Use of multiphoton laser scanning microscopy to image benzo[a]pyrene and metabolites in fish early life stages. Proceedings of BIOS 2004, International Society for Optical Engineering, San Jose, CA, January 24-29, 2004.
- Ankley, G.T., L. P. Burkhard, P.M. Cook, S.A. Diamond, R.J. Erickson, and D.R. Mount. 2003. Assessing risks from photoactivated toxicity of polycyclic aromatic hydrocarbons to aquatic organisms. In *PAHs: An Ecotoxicological Perspective*, ed. P.E.T. Pouben, Chapter 15, pp. Wiley.

OTHER ENVIRONMENTAL PAPERS/ESSAYS:

- Cook, P.M. 2005. Coming down from the peak. Sermon given at Peace UCC, Pilgrim Congregational UCC and subsequently at four other MN Churches.

NARRATIVE

Senior scientific expert on ecological risk assessment methods for toxic organic chemicals in freshwater ecosystems including the Great Lakes. Long-term research planning and execution of critical scientific experiments which define basic elements and concepts needed for establishing a risk assessment research program are accomplished. Continuing role as asbestos exposure assessment expert with emphasis on dose metrics and modeling structural and chemical characteristics of durable fibers that control relative potencies for carcinogenesis and chronic inflammatory disease.

BIOGRAPHICAL SKETCH

NAME: Kevin M. Crofton

POSITION TITLE: Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Miami University, Oxford,OH	B.A	1977	Zoology
Miami University, Oxford,OH	M.A	1980	Zoology
University of North Carolina at Chapel Hill	Ph.D.	1986	Toxicology

PROFESSIONAL EXPERIENCE

05/04 - Present Toxicologist (GS-15): Neurotoxicology Division, US EPA
09/03 - Present Adjunct Assistant Professor, Curriculum in Toxicology, UNC-Chapel Hill
09/93 - Present Adjunct Assistant Professor, Dept Environ Molec Toxicol, NC State Univ
02/98 - 05/04 Toxicologist (GS-14): Neurotoxicology Division, US EPA
06/02 - 10/02 Acting Chief, Neurophysiological Toxicology Branch, NTD, US EPA
02/02 - 06/02 Acting Chief, Neurobehavioral Toxicology Branch, NTD, US EPA
06/01 - 11/01 Detail to Office of Pesticide Programs, US EPA, Washington, DC.
05/88 - 1/98 Toxicologist (GS13): Neurotoxicology Division, NTD, US EPA
09/90 - 09/91 Adjunct Associate Professor, Department of Psychology, NC Central Univ.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

(2001-2005)

Neurobehavioral Teratology Society
International Neurotoxicology Association
Society of Toxicology/North Carolina Chapter
Society of Toxicology, Toxicological Sciences (board)
Neurotoxicology (board)
Learning Disability Association Journal (special editor)

SELECTED AWARDS AND HONORS

EPA Bronze Medal for Commendable Service (2 times)
EPA Scientific and Technological Achievement Award (5 times)
ORD Award for "Exceptional/Outstanding ORD Technical Assistance to the Regions or Program Offices" (2003)

INVITED LECTURES/SYMPOSIA

(selected presentations from 2001-2005)

ORD Pyrethroid Insecticides Research Update. Joint ORD OPP Pyrethroid Project and Office of Pesticide Programs (June 2005)
Undertaking a Positive Control Study as a Part of a Developmental Neurotoxicity Testing Procedure, presented at an ILSI Risk Science Institute (April 2004).
PBDE's as Endocrine Disruptors and Developmental Neurotoxicants, Epidemiology Branch, Division of Intramural Research, NIEHS, RTP NC (Feb 2004).
Assessing the Risk of Pyrethroid Insecticides: Cumulative and Aggregate Exposures, Global Health and Environmental Safety, Syngenta Crop Sciences, Greensboro, NC (2003)
Developmental Neurotoxicity Testing: Future Directions", presented at the Center for Alternatives to Animal Testing (CAAT), Baltimore (2003)
Short-term Exposure to an Environmental Mixture of PHAHs: Dose-Additive Effects on Serum Thyroxine", Society of Environmental Toxicology and Chemistry, Salt Lake City, UT (2002)

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Organizing Committee, Center for Alternatives to Animal Testing (CAAT) Workshop “TestSmart--Developmental Neurotoxicity” (2004 - present)
Organizing Committee, Behavioral Test Methods Workshop (2002-2003)
TERA Voluntary Children’s Chemical Evaluation Program Panel (3 chemicals)
Learning Disabilities Association of America, Professional Advisory Board (2003 - present)
Learning Disabilities Association of America, Research Committee (2003 - present)
Organizing Committee, NIEHS Workshop on “Thyroid Hormone and Brain Development: Translating Molecular Mechanisms to Population Risk, Organizing Committee (2002)

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY (selected)

Co-Chair, Goal 4 Safe Pesticides/Safe Products Implementation Team (2002 - present)
Endocrine Disruptors, Goal 4 Implementation Team (1999 - present)
Perchlorate Risk Assessment Team (1998-2004)
Ad Hoc Member OPP/HED HIARC Committee for Deltamethrin (2002)
OPP/HED Thyroid Guidance Team (2001 - present)
Inter-Agency Workgroup on Brominated Flame Retardants (2002 - present)
CoChair, NHEERL Technical Qualification Board (since 2004)

PUBLICATIONS

(from 100+ peer review publications and 10 chapters/proceedings)

Cory-Slechta,D.A., Crofton,K.M., Sheets,L.P., Ross,J.F., Weiss,B. and Foran,J.A. (2001) Methods to Identify and Characterize Developmental Neurotoxicity for Human Health Risk Assessment I: Behavioral Effects. Environ. Hlth. Perspect. 109 (Suppl. 1):79-92.
Zhou,T. Taylor,M.M., DeVito,M.J. and Crofton,K.M. (2002) Development exposure to brominated diphenyl ethers results in thyroid hormone disruption. Toxicol. Sci. 66:105-116.
Craft,E.S., Ross,D.G., DeVito,M.J. and Crofton,K.M. (2002) Comparative responsiveness of hypothyroxinemia and hepatic enzyme induction in Long-Evans rats versus C57BL/6J mice exposed to TCDD-like and phenobarbital-like polychlorinated biphenyl congeners. Toxicol. Sci. 68:372-380.
Crofton,KM, Makris,SL, Sette,Wf, Mendez,E, Raffaele,KC. (2004) A qualitative retrospective analysis of positive control data in developmental neurotoxicity studies. Neurotox. Teratol.26:345-352.
Crofton,KM (2004) Developmental disruption of thyroid hormone: correlations with hearing dysfunction in rats. Risk Anal. 24:1665-1671.
Mundy WR, Freudenrich TM, Crofton KM, DeVito MJ. (2004) Accumulation of PBDE-47 in Primary Cultures of Rat Neocortical Cells. Toxicol Sci. 82:164-169.
Shafer,T.J., Meyer, D.A., Crofton,K.M. (2005) Developmental neurotoxicity of pyrethroid insecticides: Critical review and future research needs. Environ. Health Perspect. 113:123-36.
Crofton,K.M., Gennings,C., Simmons,J.E., Fisher,K.C., DeVito,M.J. (2004) Short-term exposure to an environmental mixture of PHAHs: Dose-additive effects on serum thyroxine. Environ. Hlth. Perspect. 113:1549-1554.
Seed,J., Carney,E., Corley,R., Crofton,K.M., DeSesso,J.M., Foster,P.M.D., Kavlock,R., Kimmel,G., Klaunig,J., Meek,M.E., Preston,R.J., Slikker,W. Jr., Tabacova1,S., Williams,G.W., Wiltse,J., Zoeller,R.T., Fenner-Crisp,P., Patton,D.E. (2005) Overview: Using mode of action and life stage information to evaluate the human relevance of animal toxicity data. Crit. Rev. Toxicol. 35:663B672.
Crofton,K.M. and Zoeller, R.T. (2005) MOA: Neurotoxicity Induced by Thyroid Hormone Disruption during Development Hearing Loss Resulting from Exposure to PHAHs. Crit. Rev. Toxicol. 35:757B769.
Fisher JW, Campbell J, Muralidhara S, Bruckner JV, Ferguson D, Mumtaz M, Harmon B, Hedge JM, Crofton KM, Kim H, Almekinder TL. (2006) Temporal- and Dose- Dependent Effects of PCB 126 on Hepatic Enzymes and the Hypothalamo-Pituitary-Thyroid Axis in the Rat. Toxicol Sci. 90:87-95.

BIOGRAPHICAL SKETCH

NAME: Alva E. Daniels **POSITION TITLE:** Assistant Lab Director-Multimedia

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Texas Wesleyan College	B.S.	1988	Biology
University of Michigan	M.S.	1990	Environmental Health

PROFESSIONAL EXPERIENCE

2001- Present Assistant Laboratory Director-Multimedia
U.S. EPA, Office of Research and Development (ORD)
National Risk Management Research Laboratory (NRMRL), Cincinnati, OH

1998-1999 Assistant Division Director
U.S. EPA, Office of Research and Development (ORD)
Sustainable Technologies Division, NRMRL, Cincinnati, OH

1991-2001 Environmental Scientist
U.S. EPA, Office of Research and Development (ORD)
Sustainable Technologies Division, NRMRL, Cincinnati, OH

1990-1991 Environmental Scientist
U.S. EPA, Office of Air and Radiation (OAR)
Motor Vehicle Emissions Laboratory, Ann Arbor, MI

INVITED LECTURES/SYMPOSIA

Daniels, A., Brown, D., Voyko, J. *U.S. EPA's Environmental Technology Verification (ETV) Program - Metal Finishing Verification Center*. American Electroplaters and Surface Finishers Society (AESF), January 2000. Orlando, FL.

Daniels, A., Brown, D. *U.S. EPA's ETV Program-Pollution Prevention, Recycling, and Waste Treatment Center*. New England Waste Management Officials Association (NEWMOA) Conference, March 2001. Boston, MA.

SELECTED AWARDS AND HONORS

Scientific and Technological Achievements Reward Program (STAR) Award – 1994.
Vice-Presidential Hammer Award as part of ETV Team - 1998
U.S. EPA Bronze Medal as part of ETV Team – 2001

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

U.S. EPA/ORD representative for the **Rapid Commercialization Initiative (RCI)** Interagency Workgroup charged with implementing an Presidential initiative which encouraged the development and use of innovative environmental technologies.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

2001-Present P2/Sustainability Research Planning Team

2001-Present	Human Health Research Planning Team
2006-Present	Safe Pesticides/Safe Products Research Planning Team
2001-Present	Multimedia Pollution Prevention (M2P2) Office Directors Forum (IntraAgency Workgroup)
2003-Present	Emerging Chemicals IntraAgency Workgroup

PUBLICATIONS

Edwards, A., Kominsky, J.R., Freyberg, R.W., “*Airborne Asbestos Concentrations During Spray-Buffering of Resilient Floor Tiles*”. Applied Occupational and Environmental Hygiene, Volume 9, number 2 (89-160), February 1994, Pages 132-138.

Daniels, A.E., “*Cost Estimates of Using Three Lead-Based Paint Abatement Technologies on Residential Housing*”, Technical Monograph Series-Environmental Information Association – September 1998.

Daniels, A.E., Kominsky, J.R., Clark, P.J. “*Evaluation of Two Lead-based Paint Removal and Waste Stabilization Technology Combinations on Typical Exterior Surfaces*”, Journal of Hazardous Materials, Volume 87, Issues 1-3, 12 October 2001, Pages 117-126.

BIOGRAPHICAL SKETCH

NAME: Sally Perreault Darney

POSITION TITLE: Acting Director

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Newton College, Newton, MA	BA	1968	Biology
Brown University, Providence, RI	MAT	1969	Biomedical Sciences
U. Hawaii School of Medicine, Honolulu, HI	PhD	1980	Anatomy & Reproductive Biol.

PROFESSIONAL EXPERIENCE

1968-1970 Instructor of Biology, Bryant College, Providence RI
1970-1977 Assoc Professor of Biology, Community College of RI
1970-1975 Health Educator, Providence Lying-In Hospital, Providence, RI (part time & summers)
1984-present Research Biologist (Supervisory since 1987) US EPA, National Health & Environmental Effects Research Laboratory, RTP, NC
1997-present Adjunct Professor, Dept. of Animal Science, College of Agriculture and Life Science and Dept. Molecular Biomedical Science, School of Veterinary Medicine, NCSU, Raleigh NC

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Toxicology, Reproductive and Developmental Subspecialty Section and NC Chapter
Society for the Study of Reproduction, Board of Directors 1993-6, Treasurer 1997-2000
Biology of Reproduction, Editorial Board 1986-90; Associate Editor 2005-7
American Society of Andrology, President 2006; Council 1988-91; Program Chair 2003
Journal of Andrology, Editorial Board 2001-2006; Editor-in-Chief 2007 – 2012
Molecular Reproduction and Development, Editorial Board, 1969-current
Journal of Toxicology & Environmental Health, Part B: Critical Reviews, Associate Editor, 2001-current
Reproductive Toxicology, Editorial Board, 1992-95

SELECTED AWARDS AND HONORS

US EPA Technological and Scientific Achievement Awards, 4 Level II, 4 Level III and 2 Honorable Mention
US EPA Gold Metal for Exceptional Service in developing the EPA Guidelines for Reproductive Toxicity Risk Assessment, 1996
US EPA Bronze Metals for Commendable Service 1) Fuels and Fuel Additives Health Effects Testing Rule, 1996; 2) EPA Harmonized Reproductive and Developmental Test Guidelines, 1999; 3) Teplice Program Team, "Impact of Air Pollution on Human Health in Teplice, Czech Republic"

INVITED LECTURES/SYMPOSIA

"Keynote Address: Gender Differences in the Response of Maturing Gametes to Reproductive Toxicants," In: Quebec Winter Meeting on Reproductive Biology, Quebec, Canada, 2001.
"Failed Fertilization versus Early Embryo Loss," In: Second International Conference on Male-Mediated Developmental Toxicity, Montreal, Quebec, Canada, 2001.
"Detecting Adverse Effects on the Paternal Genome," In: March of Dimes Symposium on Male Mediated Developmental Toxicity, Annual Meeting of the Teratology Society, Montreal, Canada, 2001.
"Impact of air pollution on human semen quality including sperm chromatin structure and sperm aneuploidy," UCLA Program in Molecular Toxicology, UCLA, Los Angeles, CA, 2002.
"Exposure to intermittent air pollution and changes in semen quality: Evidence for an association and implications for

- reproductive risk assessment.” International Workshop on Advances in Human Research, Exposure and Risk Assessment Related to Reproductive and Developmental Effects, Academy of Sciences of the Czech Republic and European Network on Children’s Susceptibility and Exposure to Environmental Genotoxicants of the European Commission. Prague, CR, 2003.
- “Tracking down reproductive health risks for humans exposed to environmental contaminants.” In: President’s Symposium on Reproduction and the Environment: Society for the Study of Reproduction, 36th Annual Meeting, Cincinnati, OH, 2003.
- “Mechanisms of male reproductive toxicity: Bed, bath and beyond,” Society of Toxicology of Canada Annual Symposium, Montreal, Quebec, CA, 2004.
- “US/Global Perspective: Research Needs and Potential Interactions” in CIHR Workshop on Reproductive and Developmental Toxicology Research, Montreal, Quebec, CA, 2004.
- “Utility of Sperm Measures in Reproductive Toxicology: Of Mice (or Rats) and Men,” US EPA, ORD-OPPTS seminar series, Washington, DC, 2004.
- “Assessing the impact of environmental exposures on male reproductive health,” School of Health Systems and Public Health, University of Pretoria, Pretoria, South Africa, 2005.
- “Novel approaches for conducting environmental epidemiology studies on male reproductive health,” Department of Pharmacology & Therapeutics, McGill University, Montreal, Canada, 2006.
- “Adult exposures that may alter the reproductive axis in both males and females,” Postgraduate Course on The Environment and Reproductive Health, Pacific Coast Reproductive Society, Indian Wells, CA, 2006.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

- NIH, NICHD Special Study Section, “Culture methods for non-human gametes,” 1996
- NIH, CSR Reproductive Biology Study Section, February 2003
- NIH, Cellular, Molecular and Integrative Reproduction Study Section, February 2006.
- NIOSH, NORA (National Occupational Research Agenda) Committee on Fertility and Pregnancy Abnormalities, 1998-2006
- NIEHS, Center for the Evaluation of Risks to Human Reproduction Expert Panels on bromopropane 2001, and acrylamide 2004.
- CIHR (Canadian Institute of Health Research) special study section “Healthy Gametes and Great Embryos”, December 2002; ad hoc grant reviewer 2004-05.
- Program Chair: 23rd Annual Meeting American Society of Andrology, Phoenix, AZ, 2003
- Organizing Committee: UCSF/CHE Summit on Reproductive Health, Planning Committee, 2006

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

- US EPA, OPPTS Reproductive Risk Assessment Guidelines Committee, Washington, D.C., 1985-1996
- US EPA Office of Air & Radiation Fuels & Fuel Additive Program Work Group, 1993-99
- US EPA, OPPTS Harmonized Developmental and Two-Generation Reproductive Toxicity Test Guidelines Workgroup, 1992-99.
- US EPA, ICCVAM, NIEHS/NICEATM: Member of Endocrine Disruptors Working Group, 2001-
- US EPA and HDDS (NICHD, NIEHS, CDC) National Children’s Study: Workgroup on Fertility and Early Pregnancy, 2001- 04.
- US EPA, ORD NHEERL Technical Qualifications Review Board (Promotions), 2000-3.
- US EPA, ORD Goal 4 (Safe Pesticides/Safe Products) Multi Year Plan Committee, 2000-05; and NHEERL Goal 4 MYP Implementation Team 2003 – present
- Reviewer: Acrylamide Risk Assessment (NCEA); nBromopropane PEL (OMS); Perchlorate Risk Assessment (NCEA), Cyanide Risk Assessment (OW)

PUBLICATIONS

(Publications represent 18 out of a total of 150 for the period 2000-2007)

- Perreault, S.D. and Cancel, A. (2001). Significance of incorporating measures of sperm production and function into rat toxicology studies. *Reproduction* 121: 207-216.
- Klinefelter, G.R., Welch, J. E., Perreault, S.D., Moore, H.D., Zucker, R.M., Suarez, J.D., Roberts, N. L., Bobseine, K, and Jeffay, S. (2002). Localization of the sperm protein SP22 and inhibition of fertility in vivo and in vitro. *J. Androl.* 23:48-63.
- Rubes, J., Vozdova, M., Robbins, W.A., Rezacova, O., Perreault, S.D., and Wyrobek, A.J. (2002). Stable variants of sperm aneuploidy among healthy men show associations between germinal and somatic aneuploidy. *Amer. J. Hum. Genet.*, 70:1507-19.
- Lawson, C.C., Schnorr, T.M., Daston, G.P., Grajewski, B., Marcus, M., McDiarmid, M., Murono, E., Perreault, S.D., Shelby, M. and Schrader, S.M. (2002). An occupational research agenda for the third millennium. *Environ. Health Persp.*, 111:584-592.
- Perreault, S.D. (2002). Smart use of computer-aided sperm analysis (CASA) to characterize sperm motion. In: B. Robaire and B.H. Hinton (eds.) *The Epididymis*, Kluwer Academic/Plenum Publishers, New York, pp. 459-471.
- Zuelke, K.A., Jeffay, S.C., Zucker, R.M. and Perreault, S.D. (2003). Glutathione (GSH) concentrations vary with the cell cycle in maturing hamster oocytes, zygotes and pre-implantation stage embryos. *Molec. Reprod. Dev.* 64:106-112.
- Stoker, T.E. Jeffay, S.C., Zucker, R.M., Cooper, R.L. and Perreault, S.D. (2003). Abnormal Fertilization is Responsible for Reduced Fecundity Following Thiram-induced Ovulatory Delay in the Rat. *Biol. Reprod.*, 68:2142-49.
- Young, K.E., Robbins, W.A., Xun, L., Elashoff, D., Rothmann, S.A. and Perreault, S.D. (2003). Evaluation of chromosome breakage and DNA integrity in sperm: An investigation of home semen collection conditions. *J. Androl.* 24(6):853-861.
- Perreault, S.D., Aitken, R.J., Baker, H.W.G., Evenson, D.P., Huszar, G., Irvine, D.S., Morris, I.D., Morris, R.A., Robbins, W.A., Sakkas, D., Spano, M. and Wyrobek, A.J. (2003) Integrating new tests of sperm genetic integrity into semen analysis: Breakout group discussion. *Adv. Exp. Med. Biol.* 518:253-268.
- Perreault, S.D. (2003). Distinguishing between fertilization failure and early pregnancy loss when identifying male-mediated adverse pregnancy outcomes. *Adv. Exp. Med. Biol.* 518:189-198.
- Miki, K., Qu, W, Goulding, E.H., Willis, W.D., Bunch, D.O., Strader, L. F., Perreault, S.D., Eddy, E.M. and O'Brien, D.A. (2004) Glyceraldehyde 3-phosphate dehydrogenase-S, a glycolytic enzyme, is required for sperm motility and male fertility. *Proc Natn Acad Sci*, 101:16501-06.
- Boekelheide, K., Perreault Darney, S., Daston, G.P., David, R.M., Luderer, U., Olshan, A.F., Sanderson, W.T., Willhite, C.C. and Woskie, S. (2004). NTP-CERHR Expert Panel Report on the Reproductive and Developmental Toxicity of 1-Bromopropane. *Reproductive Toxicology* 18:157-188.
- Boekelheide, K., Perreault Darney, S., Daston, G.P., David, R.M., Luderer, U., Olshan, A.F., Sanderson, W.T., Willhite, C.C. and Woskie, S. (2004). NTP-CERHR Expert Panel Report on the Reproductive and Developmental Toxicity of 2-Bromopropane. *Reproductive Toxicology* 18:189-217.
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- Rubes, J., Vozdova, M., Oracova, E., and Perreault, S.D. (2005). Individual variation in the frequency of sperm aneuploidy in humans. *Cytogen Genome Res*, 111:229-236.
- Rubes, J., Selevan, S.G., Zudova, D., Zudova, Z., Evenson, D.P. and Perreault, S.D. (2005). Exposure to episodic air pollution is associated with increased DNA fragmentation in human sperm without other changes in semen quality. *Hum. Reprod.* 20:2776-2783 (Epub ahead of print, June 24, 2005).

Lawson, C.L., Grajewski, B., Daston, G.P., Frazier, L., Lynch, D., McDiarmid, M., Muroso, E., Perreault, S.D., Robbins, W., Shelby, M., and Whelan, E.A. (2006) Implementing a national occupational reproductive research agenda: Decade one and beyond. *Environ. Health Persp.* 114:435-41. [Epub ahead of print, October 26, 2005].
Perreault, S.D., Klinefelter, G.R. and Clegg, E.D., (2007). Assessment of male reproductive toxicity. In: A.W. Hayes (ed.) *Principles and Methods of Toxicology*, 5rd Edition. Taylor and Francis, Philadelphia, in press.

NARRATIVE

Major research programs at EPA: Computer-Assisted Sperm Analysis (Superfund); Critical Windows for Gamete Function (RIHRA program); Genetic indicators of sperm quality (SC); Disinfectant Byproducts (DW) in test species and epidemiology study on association between DBPs and semen quality.

BIOGRAPHICAL SKETCH

NAME: Sigmund J Degitz Jr.

POSITION TITLE: Research Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Northland College, Ashland, WI	B.S.	1991	Biology
University of Illinois, Urbana-Champaign, IL	Ph.D.	1996	Toxicology

PROFESSIONAL EXPERIENCE

11/03-present Adjunct Associate Professor: Department of Biology, University of Minnesota Duluth Campus, Duluth, Minnesota
1998-Present Toxicologist, U.S. EPA, Duluth, MN
1996-1998 Postdoctoral Research Fellow, University of North Carolina, Chapel Hill

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Editorial board for Ecotoxicology and Environmental Safety 2004-present

Editorial board for Environmental Toxicology and Chemistry 2006

SELECTED AWARDS AND HONORS

Bronze Medal *OECD Support Team*. For leadership in development of internationally-harmonized EDC Test methods through the OECD. 2003

Bronze Medal *Promoting Strong Science in Agency Decisions*. For significant achievements in working with program offices to promote the use of strong science in Agency decisions. 2003

STAA award level 3

INVITED LECTURES/SYMPOSIA

Thyroid axis inhibition in *Xenopus laevis*: Development of an amphibian-based screening assay. 2002 National SETAC meeting.

A Multi-Endpoint Strategy for Determining Mechanism of Action of Thyroid Active Chemicals. Fourth SETAC World Congress, November 14-18 2004, Portland, Oregon, USA.

Organization for Economic Cooperation and Development Workshop on Toxicogenomics. October 13-15, 2004, Kyoto, Japan

Xenobiotic Disruption The Amphibian Thyroid Axis. March 18 2005, University of Minnesota, Duluth, Minnesota.

Developmental Biology At Work for The US EPA. April 12 2005, University of Minnesota, Duluth, Minnesota.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

ICCA Genomics Workshop, March 7 and 8, 2001, Orlando, Florida

ACC Wildlife Endocrine Symposium October 30, 2001, Arlington, VA

Learning Fund Workshop on Amphibian Toxicity Test Methods, January 17-19, 2002, North Vancouver, BC, Canada

Molecular Biology and Risk Assessment: Evaluation OF The Potential Roles OF Genomics IN Regulatory Ecotoxicology September 18–22 2005, Pellston, Michigan.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Tietge JJ, GT Ankley and SJ Degitz. Report on the *Xenopus* tail resorption assay as a Tier 1 screen for thyroid active chemicals. Internal EPA report to OPPTS. 2000.

Breakout group leader. NCEA Genomic and Risk Assessment Colloquium. May 8th 2003, Alexandria, Virginia.

Co-Chair/Breakout group leader. International Workshop on the Use of Anuran Models in Endocrine Disruption and Reproductive Toxicology Research, June 24-25 2003, Duluth, MN.

Discussion of Phase I of the Amphibian Metamorphosis Assay March 10-11 2004, Hiroshima, Japan

US-Japan Bilateral Collaboration on Ecotoxicity Assays for Endocrine Disruption Initial Meeting. October 2004, Tokyo, Japan

US-Japan Bilateral Collaboration on Ecotoxicity Assays for Endocrine Disruption 2nd Meeting. June 2005, Honolulu, Hawaii

PUBLICATIONS

Ankley GT, Daston GP, Degitz SJ, Denslow ND, Hoke RA, Kennedy SW, Miracle AL, Perkins EJ, Snape J, Tillitt DE, Tyler CR, and D Versteeg (2006) Toxicogenomics in Regulatory Ecotoxicology *Environmental Science and Technology* 40(13):4055-4065.

Zhang F, Degitz SJ, Holcombe GW, Kosian PA, Tietge J, Veldhoen N, Helbing CC. (2006) Evaluation of gene expression endpoints in the context of a *Xenopus laevis* metamorphosis-based bioassay to detect thyroid hormone disruptors. *Aquatic Toxicology*. 76(1):24-36.

Degitz SJ, Holcombe GW, Flynn KM, Kosian PA, Korte JJ, Tietge JE.(2005) Progress towards development of an amphibian-based thyroid screening assay using *Xenopus laevis*. Organismal and thyroidal responses to the model compounds 6-propylthiouracil, methimazole, and thyroxine. *Toxicological Sciences*. 87(2):353-64.

Tietge, JE, GW, Holcombe, KM, Flynn, PA, Kosian, JJ, Korte, LE, Anderson, DC, Wolf, and SJ, Degitz. (2005). Metamorphic inhibition of *Xenopus laevis* by sodium perchlorate: effects on development and thyroid histology. *Environmental Toxicology and Chemistry*, 24:926-933.

Ankley GT, SJ Degitz, SA Diamond, and JE Tietge (2004). Assessment of environmental stressors potentially responsible for malformations in North American anuran amphibians. *Ecotoxicology and Environmental Safety* 58, 7-16.

Degitz SJ, Rogers JM, Zucker RM, Hunter ES 3rd. (2004) Developmental toxicity of methanol: Pathogenesis in CD-1 and C57BL/6J mice exposed in whole embryo culture. *Birth Defects Res Part A Clin Mol Teratol*. 70,179-84

Degitz SJ, Zucker RM, Kawanishi CY, Massenburg GS, Rogers JM. (2004) Pathogenesis of methanol-induced craniofacial defects in C57BL/6J mice. *Birth Defects Res Part A Clin Mol Teratol.* 70, 172-8.

Rogers JM, Brannen KC, Barbee BD, Zucker RM, Degitz SJ. (2004) Methanol exposure during gastrulation causes holoprosencephaly, facial dysgenesis, and cervical vertebral malformations in C57BL/6J mice. *Birth Defects Res Part B Dev Reprod Toxicol.* 71, 80-8.

Kosian PA, EA Makynen, GT Ankley, and SJ Degitz. (2003) Bioconcentration and Metabolism of All-Trans Retinoic Acid by Three Native North American Ranids. *Toxicological Sciences* 74, 147-156.

Degitz SJ, PA Kosian, GW Holcombe, JE Tietge, EJ Durhan, and GT Ankley. (2003) Comparing the effects of Retinoic Acid on amphibian limb development and lethality: chronic exposure results in lethality not limb malformations. *Toxicological Sciences* 74, 139-146

Degitz SJ, EJ Durhan, PA Kosian, GT Ankley, and JE Tietge. (2003) Development toxicity of methoprene and its degradation products in *Xenopus laevis*. *Aquatic Toxicology* 64, 97-105.

Gray, L.E, Ostby, V. Wilson, C. Lambright, K. Bobseine, P. Hartig, A. Hotchkiss, C. Wold, J. Furr, M. Price, L. Parks, R. Cooper, T. Stoker, S. Laws, S. Degitz, K.M. Jensen, M.D. Kahl, J.J. Korte, E.A. Makynen, J.E. Tietge, and G.T. Ankley (2002) Xenoendocrine disruptors - tiered screening and testing: Filling key data gaps. *Toxicology.* 181-182, 371-82.

Simon R, JE Tietge, B Michalke, SJ Degitz, and KW Schramm. (2002) Iodine species and the endocrine system: thyroid hormone levels in adult *Danio rerio* and developing *Xenopus laevis*. *Anal Bioanal Chem* 372, 481-5

Tietge, JE, SA Diamond, GT Ankley, DL DeFoe, GW Holcombe, KM Jensen, SJ Degitz, GE Elonen, and E Hammer (2000). Ambient solar UV-B causes mortality in larvae of three species of Rana. *Photochemistry and Photobiology* 74, 261-268.

Degitz SJ, PA Kosian, EA Makynen, KM Jensen and GT Ankley (2000) Stage- and Species-specific Developmental Toxicity of All- Trans Retinoic Acid in Four Native North American Ranids and *Xenopus laevis*. *Toxicological Sciences* 57, 264-274.

Ankley GT, JE Tietge, GW Holcombe, DL DeFoe, SA Diamond, KM Jensen, and SJ Degitz. (2000) Effects of laboratory ultraviolet light and natural sunlight on survival and development of *Rana pipiens*. *Can. J. Zool.* 78, 1092-1100.

BIOGRAPHICAL SKETCH

NAME: Nancy Denslow

POSITION TITLE: Associate Professor

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Mary Washington College, Fredericksburg, VA	B.S.	1966	Chemistry
Yale University, New Haven, CT	M.S.	1967	Biochemistry
University of Florida, Gainesville, FL	Ph.D.	1975	Biochemistry

PROFESSIONAL EXPERIENCE

1976-1977	Visiting Professor of Biochemistry, University of Ceara, Brazil
1981-1993	Assistant Scientist, Dept. of Biochemistry and Molecular Biology, University of Florida
1988-1993	Technical Director, Protein Chemistry Core Facility, Interdisciplinary Center for Biotechnology Research, University of Florida
1994-2001	Associate Scientist, Dept. of Biochemistry and Molecular Biology, University of Florida
1993-2004	Scientific Director, Protein Chemistry and Molecular Biomarkers Core Facility, Interdisciplinary Center for Biotechnology Research, University of Florida.
2001-2004	Scientist, Dept. of Biochemistry and Molecular Biology, and Interdisciplinary Center for Biotechnology Research University of Florida.
2004-present	Associate Professor, Department of Physiological Sciences, College of Veterinary Medicine, University of Florida, Gainesville, FL

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Society for Biochemistry and Molecular Biology
Society of Toxicology
Society for Environmental Toxicology and Chemistry
Association of Biomedical Research Facilities, Executive Board member (2004-2008), ESRG chair (2004-2005)
FASEB Excellence in Science Award Committee, 2005-2008
Environmental Chemistry and Toxicology, 1998 -2001; 2002-2005
Comparative Biochemistry and Physiology, Part D, Toxicogenomics, Associate Editor, 2004-present
Environmental Bioindicators, Associate Editor, 2006-present

INVITED LECTURES/SYMPOSIA (7 of 37 for the last 5 years)

Denslow, N.D., "The use of real time PCR, differential display RT-PCR and gene arrays to evaluate endocrine disruption in fish." Invited Presentation. Wildlife Toxicology Program Science Meeting, Ontario, Canada, Oct. 24-26, 2001.

Denslow, N.D. "Gene expression patterns in largemouth bass exposed to endocrine disruptors," Invited Presentation. International Congress in Comparative Physiology and Biochemistry, Mt. Buller, Australia, Jan, 2003.

Denslow, N.D., "Array technology as a tool to measure exposure of fish to endocrine disruptors," Invited Presentation,
Workshop on functional genomics of the response to pollutants and pathogens in fish and shellfish, Castellón de la Plana, Spain, September 4, 2004.

Denslow, N.D. "Alteration of gene expression patterns in fish by estrogenic and androgenic compounds," Invited State

of the Art Presentation, 5th International Symposium on Fish Endocrinology, Castellón de la Plana, Spain, September 5-9, 2004.

Denslow, N.D. Gene Expression Profiles to Measure Endocrine Disruption in Fish. Duke University Integrated Toxicology Program 2004 Fall Symposium, "Comparative Toxicogenomics", Durham, NC, Nov 19, 2004.

Denslow, N.D. Ecotoxicology and the Molecular Biology Approach. Invited opening lecture. Workshop "Microarray and Proteomics: Application to the Ecotoxicology," Joint Research Consortium of the European Union, Ispra, Italy, May 19-20, 2005.

Denslow, N.D. The Promise of Microarrays and Proteomics Approaches to Assess Endocrine Disruption in Fish, Plenary speaker, 4th Biennial CALFED Science Conference-2006, Sacramento, CA, Oct 23-26, 2006.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Denslow, N.D. Invited Participant, Joint SOT-SETAC Pellston Workshop on Comparative Toxicogenomics, Portland, OR, July 2004.

Denslow, N.D. Invited Participant, SETAC Pellston Workshop on Toxicogenomics in Regulatory Toxicology, Pellston, MI, Sept. 11-15, 2005.

Denslow, N.D. and Miracle, A. Molecular Indicators for Ecological Exposure, Platform session chairs, SETAC World Congress, Portland, Oregon, Nov 14-18, 2004.

PUBLICATIONS

(Publications represent 20 out of a total of 70 for the period 1998-2006 and 118 publications over entire career)

Gronen, S., N. **Denslow**, S. Manning, S. Barnes, D. Barnes, and M. Brouwer, "Serum Vitellogenin Levels and Reproductive Impairment of Male Japanese Medaka (*Oryzias latipes*) Exposed to 4-*tert*-Octylphenol," Environmental and Health Perspectives, 107:385-390 (1999).

O'Brien, T.W., S.E. Fiesler, **ND Denslow**, B. Wittmann-Liebold, B. Thiede, EB Mougey, JE Sylvester, and HR Graack, "Mammalian Mitochondrial Ribosomal Proteins (2): Amino Acid Sequencing, Characterization and Identification of Corresponding Gene Sequences." J. Biol. Chem. 274:36043-36051, 1999.

Denslow, N.D., M. Chow, KJ. Kroll and L. Green "Vitellogenin as a Biomarker of Exposure to Estrogen or Estrogen Mimics." Ecotoxicology, 8:385-398, 1999.

Bowman, C.J., and **Denslow, N.D.** Development and Validation of a Species- and Gene-Specific Molecular Biomarker: Vitellogenin mRNA in Largemouth Bass (*Micropterus salmoides*), Ecotoxicology, 8:399-416, 1999.

Folmar, L.C., M. Hemmer, R. Hemmer, C. Bowman, K. Kroll, and **ND Denslow**, "Comparative Estrogenicity of Estradiol, Ethynyl estradiol and Diethylstilbestrol in an *In vivo*, Male Sheepshead Minnow (*Cyprinodon variegatus*) Vitellogenin Bioassay." Aquatic Toxicology, 49:77-88 (2000).

Bowman, C.J., K.J. Kroll, M.J. Hemmer, L.C. Folmar, and **N.D. Denslow**. Estrogen-Induced Vitellogenin mRNA and Protein in Sheepshead Minnow (*Cyprinodon variegatus*), General and Comparative Endocrinol., 120:300-313 (2000).

Hemmer, M.J., Hemmer, B.L., Bowman, C.J., Kroll, K.J., Folmar, L.C. Marcovich, D., Hoglund, M.D. and **Denslow, N.D.** Effect of p-nonylphenol, methoxychlor, and endosulfan on vitellogenin induction and expression in sheepshead minnow (*Cyprinodon variegatus*). Environ. Tox.Chem. 20:336-343 (2001).

Folmar, L.C., **Denslow, N.D.**, Kroll, K., Orlando, E.F., Enblom, J., Marcino, J., Metcalfe, C., Guillette, L.J. Altered Serum Sex Steroids and Vitellogenin Induction in Walleye (*Stizostedion vitreum*) Collected Near a Metropolitan Sewage Treatment Plant. Arch. Environ. Contam. Toxicol, 40:392-398 (2001).

Denslow, N.D., Bowman, C.J., Ferguson, R.J., Lee, H.S., Hemmer, M.J. and Folmar, L.C. Induction of Gene Expression in Sheepshead Minnows (*Cyprinodon variegatus*) Treated with 17- β -Estradiol, Diethylstilbestrol or Ethinylestradiol: The Use of mRNA Fingerprints as an Indicator of Gene Regulation. General Comp. Endocrinol., 121:250-260 (2001).

Denslow, N.D., Lee, H.S., Bowman, C.J., Hemmer, M.J. and Folmar, L.C. Multiple Responses in Gene Expression

- in Fish Treated with Estrogen. *Compar. Biochem. and Physiol. Part B* 129: 277-282 (2001).
- Bowman, C.J., Kroll, K.J., Gross, T.G., **Denslow, N.D.** Estradiol-induced gene expression in largemouth bass (*Micropterus salmoides*). *Mol. Cell Endocrinol.* 196:67-77 (2002).
- Larkin, P., Folmar, L.C., Hemmer, M.J., Poston, A.J., **Denslow, N.D.** Expression Profiling of Estrogenic Compounds using a Sheepshead Minnow cDNA Macroarray, *EHP Toxicogenomics*, 111:29-36 (2003).
- Denslow, N.D.**, Michel, M.E., Temple, M.D., Hsu, C., Saatman, K., and Hayes, R.L. Application of Proteomics Technology to the Field of Neurotrauma, *J. Neurotrauma*, 20: 401-407 (2003).
- Sabo-Attwood, T., Kroll, K.J., and Denslow, N.D. Differential expression of estrogen receptor isotypes, alpha, beta and gamma by estradiol. *Molecular and Cellular Endocrinology*, 218:107-118 (2004).
- Denslow ND**, J. Kocerha, M.S. Sepulveda, T. Gross, and S.E. Holm, Gene Expression Fingerprints of Largemouth Bass (*Micropterus salmoides*) Exposed to Pulp and Paper Mill Effluents. *Mutation Res.* 552:19-34 (2004).
- LaFleur Jr., G.J., D. Raldua, M. Fabra, O. Carnevali, **N.D. Denslow**, R.A. Wallace, J. Cerda, Fundulus Heteroclitus Yolk Proteins. I. Derivation from Parental Vitellogenins and Alternative Processing During Oocyte Maturation. *Biol. Reprod.* 73:815-824 (2005).
- Stevens S.M. Jr, A.Y. Chung, M.C. Chow, S.H. McClung, C.N. Strachan, A.C. Harmon, **N.D. Denslow** and L. Prokai L. Enhancement of phosphoprotein analysis using a fluorescent affinity tag and mass spectrometry. *Rapid Commun Mass Spectrom.* 19:2157-2162 (2005).
- Garcia-Reyero, N., D.S. Barber, T.S. Gross, K.G. Johnson, M.S. Sepulveda, N.J. Szabo, **N.D. Denslow.** "Dietary exposure of largemouth bass to OCPs changes expression of genes important for reproduction." *Aquat Toxicol.* 78:358-369 (2006).
- Ottens AK, G. Kitlen, W.E. Haskins, B.E. O'Steen, M.C. Liu, R.L. Hayes, **N.D. Denslow**, and K.K.W. Wang, A Quantitative Degredomics Approach To Biomarker Validation by nano-LC/MSMS, *Analytical Chemistry*, 77:4836-4845 (2005).
- Ankley, GT., G.P. Daston, S.J. Degitz, **N.D. Denslow**, R.A. Hoke, S.W. Kennedy, A.L. Miracle, E.J. Perkins, J. Snape, D.E. Tillit, C.R. Tyler, D. Versteeg. Toxicogenomics in regulatory exotoxicology. *Environ Sci. Technol.* 40: 4055-4065 (2006).

NARRATIVE

My research interests include defining molecular bioindicators for exposure of fish to toxicants in the environment. I have focused on endocrine disruptors but am also interested in pharmaceuticals and nanoparticles. I intend to apply genomics technologies to define modes of action for adverse effects from contaminants. At the same time, I am interested in developing fundamental understanding of sex hormone-receptor interactions in fish.

BIOGRAPHICAL SKETCH

NAME: Stephen E. Duirk

POSITION TITLE: Environmental Engineer

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Ohio University	B.S.	1996	Civil Engineering
University of Akron	M.S.	1999	Environmental Engineering
University of Iowa	Ph.D.	2003	Environmental Engineering

PROFESSIONAL EXPERIENCE

- 10/03- Present Environmental Engineer (Term Federal Post Doc)
United States Environmental Protection Agency, Office of Research and Development, National Exposure Research Laboratory, Athens, GA
- 8/99 – 5/03 Research Assistant
University of Iowa, Department of Civil and Environmental Engineering, Iowa City, IA
- 8/97 - 8/99 Research Assistant
University of Akron, Department of Civil and Environmental Engineering, Akron, OH
- 9/96 - 8/97 Civil/Environmental Engineer
British Petroleum Oil Company, Warrensville Heights, Ohio.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Water Works Association

American Chemical Society

INVITED LECTURES/SYMPOSIA

Duirk, S. E. Research Opportunities for University of Georgia Undergraduates at ERD, Student Chapter of American Chemical Society, University of Georgia, March 29, 2005

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Duirk, S.E., Tarr, J.C., and Collette, T.W. Organophosphate Pesticide Degradation in the Presence of Naturally Occurring Aquatic Constituents Under Drinking Water Treatment Conditions. Annual Conference, American Water Works Association, San Antonio, TX, United States, June 11-15, 2006.

Duirk, S.E., Tarr, J.C., and Collette, T.W. Aqueous Chlorination of Chlorpyrifos in the Presence of Bromide and Natural Organic Matter. 231st ACS National Meeting, Atlanta, GA, United States, March 26-30, 2006.

Duirk, S.E. Degradation Pathways of Chlorpyrifos Under Drinking Water Treatment Conditions. U.S. EPA ORD/ERD Seminar Series, Athens, GA, United States, January 19, 2006.

Duirk, S. E. and Collette, T. W. Organophosphate Degradation Under Drinking Water Treatment Conditions: Modeling Perspectives. Annual Conference, American Water Works Association, San Francisco, CA, United States,

June 13-16, 2005.

Duirk, S. E. Research, Data, and Modeling Needs. Drinking Water Treatment Scientist-to-Scientist Meeting, US EPA, Washington D.C., United States, January 28-29, 2004.

Henderson, W.M., Duirk, S.E., Weber, E.J. and Smith, M.A. Mammalian Metabolism and Distribution of Perfluorooctyl Ethanol (8-2 Telomer Alcohol) and Its Oxidation Metabolites

- ? 44rd Annual Meeting of the Society of Toxicology, New Orleans, LA. March 2005
- ? Southeastern American Association for Laboratory Animal Science, Athens, GA, April 2005
- ? Interdisciplinary Toxicology Program Conference, Athens, GA, March 2005
- ? Southeast Chapter of the Society for Toxicology Annual Symposium, Atlanta, GA, October 2004

Duirk, S.E., Whitney, J.C., and Valentine, R.L. Preliminary Investigations into Chloramine Loss and DBP Formation in the Presence of NOM and Bromide. Annual Conference, American Water Works Association, New Orleans, LA, United States, June 16-20, 2002.

Duirk, S.E. and Valentine, R.L. Modeling monochloramine loss in the presence of natural organic matter and formation of haloacetic acids. 24th Annual Midwest Environmental Chemistry Workshop. Minneapolis, MN, United States, October 6-7, 2001.

Duirk, S.E., Gombert, B., Croue, J.P., and Valentine, R.L. Modeling monochloramine loss in the presence of natural organic matter and relationship to haloacetic acid formation. 222nd ACS National Meeting, Chicago, IL, United States, August 26-30, 2001.

Duirk, S.E., Gombert, B., and Valentine, R.L. Modeling the reactions of monochloramine and free chlorine with NOM. Annual Conference, American Water Works Association, Washington D.C., United States, June 17-21, 2001.

Duirk, S.E., Bower, K., and Miller, C.M. Development of an enhanced ozone-hydrogen peroxide advanced oxidation process. 216th ACS National Meeting, Boston, MA. United States, August 23-27, 1998.

Duirk, S.E., Butala, W., and Miller, C.M. Encapsulation of nitrate salt waste using polysiloxane. 216th ACS National Meeting, Boston, MA, United States, August 23-27, 1998.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Duirk, S. E. Research, Data, and Modeling Needs. Drinking Water Treatment Scientist-to-Scientist Meeting, US EPA, Washington D.C., United States, January 28-29, 2004.

2006 QAPP for Procedures for the Preliminary Laboratory Studies on the Effects of Chlorinated Water on OP pesticides: Worked with James Hetrick as a project consultant.

PUBLICATIONS

Duirk, S.E. and Valentine, R.L. (2006) Modeling Dichloroacetic Acid Formation from the Reaction of Monochloramine with Natural Organic Matter. *Water Research* 40(14): 2667-2674.

Cherney, D.P., Duirk, S.E., Tarr, J.C., and Collette, T.W. (2006) Monitoring the Speciation of Aqueous Free Chlorine from pH 1 to 12 with Raman Spectroscopy to Determine the Identity of the Potent Low-pH Oxidant. *Applied Spectroscopy* 60(7): 764-772.

Duirk, S.E. and Collette, T.W. (2006) Degradation of Chlorpyrifos in Aqueous Chlorine Solutions: Pathways,

Kinetics, and Modeling. *Environmental Science and Technology* 40(2): 546-551.

Duirk, S.E. and Collette, T.W. (2005) Organophosphate Pesticide Degradation Under Drinking Water Treatment Conditions. U.S. Environmental Protection Agency, Athens, GA. Publication No. [EPA/600/R-05/103](#)

Duirk, S.E., Gombert, B., Croue, J.P., and Valentine, R. L. (2005) Modeling Monochloramine Loss in the Presence of Natural Organic Matter. *Water Research*, 39(14): 3418-3431.

Valentine R.L. and Duirk, S.E. (2003) Mechanisms and Kinetics of Chloramine Loss and By-Product Formation in the Presence of Reactive Drinking Water Distribution System Constituents. Department of Civil and Environmental Engineering, University of Iowa. Publication No. EPA STAR Report 826-832-01-0

Choi, J., Duirk, S.E., and Valentine, R.L. (2002) Mechanistic studies of N-nitrosodimethylamine (NDMA) formation in chlorinated drinking water. *Journal of Environmental Monitoring*, 4(2): 249-252.

Duirk, S.E., Gombert, B., Choi, J., and Valentine, R.L. (2002) Monochloramine loss in the presence of humic acid. *Journal of Environmental Monitoring*, 4(1): 85-89.

Miller, C.M., Duirk, S.E., and Gardner, K.H. (2000) Chromium Leaching from Silicon Foam-Encapsulated Mixed Waste. *Environmental Science and Technology*, 34(3): 455-460.

Duirk, S.E., Butala, W., and Miller, C.M. Chapter 17 Encapsulation of Nitrate Salt Waste Using Polysiloxane, *Emerging Technologies in Hazardous Waste Management 8*, Kluwer Academic/Plenum Publishers, pp. 199-206, 2000.

Bower, K., Duirk, S.E., and Miller, C.M. Chapter 14 Development of and Enhanced Ozone-Hydrogen Peroxide Advanced Oxidation Process, *Emerging Technologies in Hazardous Waste Management 8*, Kluwer Academic/Plenum Publishers, pp. 167-176, 2000.

BIOGRAPHICAL SKETCH

NAME: Drew Ekman

POSITION TITLE: Chemist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Georgia	B.S.	1997	Biochemistry
University of Tennessee	M.S.	2000	Biochemistry
University of Georgia	Ph.D.	2003	Biochemistry

PROFESSIONAL EXPERIENCE

2003-present: Federal postdoctoral associate (chemist), EPA, Process and Modeling Branch, Ecosystems Research Division, NERL, Athens, GA.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

2006-present: Member of Metabolomics Society

SELECTED AWARDS AND HONORS

2005: STAA Award, Level III

2005, 2006: EPA Superior Accomplishment Recognition Award

INVITED LECTURES/SYMPOSIA

Ekman, D., Collette, T., Garrison, W., Kenneke, J., Mazur, C. Assessing Triazole Toxicity Using NMR-based Metabolomics. Presented at the U.S. Triazole Task Force (USTTF) meeting hosted by EPA. Raleigh, NC. March, 2006.

Ekman, D.R., Konwick, B.J., Garrison, A.W., Kenneke, J.F., Collette, T.W., Fisk, A.T. Investigating the Enantioselective Toxicity of Conazole Fungicides in Rainbow Trout Through the Use of NMR-based Metabolomics. Presented for the Modern Chiral Pesticides Division of the American Chemical Society (ACS). Washington, D.C. August, 2005.

Collette, T.W., Ekman, D.R., Garrison, A.W., Kenneke, J.F., Whitehead, T., Cherney, D. Role of Metabolomics as a Diagnostic Tool for Small Fish Toxicology and Other Applications. Presented at the U.S. EPA STAR Computational Toxicology Research Seminar. RTP, NC. July, 2005.

Ekman, D.R. Establishing a Metabonomics Research Program in Support of EPA's Computational Toxicology Research Initiative. Presented to researchers at the Pacific Northwest National Laboratory. Richland, WA. September, 2004.

Ekman, D.R., Kenneke, J.F., Metabonomics: A Major Focus for EPA's Computational Toxicology Program. Presented to researchers at The Imperial College of Science, Technology, and Medicine. London, UK. July, 2004.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Collaborative efforts with researchers in the United Kingdom to determine markers of exposure in rodents for triazole fungicides using NMR-based metabolomics.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

2004-present. Member of the EPA Office of Research and Development Genomics Technical Framework Steering Committee charged with developing a framework for analysis and acceptance criteria for genomics information for scientific and regulatory purposes.

PUBLICATIONS

(Publications represent 8 out of a total of 8 for the period 2000-2006)

Cherney, D., **Ekman, D.**, Dix, D.J., Collette, T. (2006). Raman Spectroscopy-Based Metabolomics for Differentiating Toxicities of Triazole Fungicides Using Rat Urine. *in preparation*.

Ekman, D.R., Collette, T.C., Ankley, G.T., Villeneuve, D., Jensen, K., Kahl, M., Teng, Q. (2006). The Potential for Urine as a Biofluid for NMR-based Metabolomics in the Small Fish Model *Pimephales Promelas*. *in preparation*.

Ekman, D.R., Keun, H.C., Eads, C.D., Furnish, C.M., Murrell, R.N., Rockett, J.C., Dix, D.J. (2006). Metabolomic Evaluation of Rat Liver and Testis to Characterize the Toxicity of Triazole Fungicides. *Metabolomics* **2** (2), 63-73.

Ekman, D.R., Wolfe, N.L., Dean, J.F.D. (2005). Gene Expression Changes in *Arabidopsis thaliana* Seedling Roots Exposed to the Munition Hexahydro-1,3,5-trinitro-1,3,5-triazine. *Environmental Science and Technology* **39**, 6313-6320.

Ekman, D.R., Lorenz, W.W., Przybyla, A.E., Wolfe, N.L., Dean, J.F.D. (2003). SAGE Analysis of Transcriptome Responses in *Arabidopsis thaliana* Roots Exposed to TNT. *Plant Physiology* **133**, 1397-1406.

Ekman, D.R., Wright E., DiGiammarino, E. L., Serpersu, E. H. (2001). Conformation of the Aminoglycoside Antibiotic Isepamicin in the Active Site of Aminoglycoside Nucleotidyl-Transferase 2"-Ia. *Biochemistry* **40**, 7017-24

Cox, J.R., **Ekman, D.R.**, Akal-Strader, A., DiGiammarino, E. L., Serpersu, E. H. (2000) Aminoglycoside Antibiotics Bound to Aminoglycoside-detoxifying Enzymes and RNA Adopt Similar Conformations. *Cell Biochemistry and Biophysics*, **33** (3), 297-308.

Serpesu, E. H., Cox, J. R., DiGiammarino, E., Mohler, M.L., **Ekman, D. R.**, Akal-Strader, A, Owston, M. (2000) Conformation of Antibiotics in the Active Site of Aminoglycoside-detoxifying Enzymes. *Cell Biochemistry and Biophysics*, **33** (3), 309-321.

NARRATIVE

My M.S. work at the University of Tennessee focused on determining the conformations of aminoglycoside antibiotic molecules bound to bacterial enzymes responsible for conferring resistance. The ultimate goal of this research was the design of inhibitors to these enzymes that would remove resistance and restore the effectiveness of this important class of antibiotics.

My Ph.D. work was directed at using genomics techniques (primarily SAGE and microarrays) to determine plant metabolic pathways involved in conferring tolerance and degradative abilities to military explosive compounds such as TNT and RDX. The ultimate goal of this research was to use the genes identified as being important in these pathways to genetically engineer plants with enhanced abilities to remediate contaminated sites.

Since joining the EPA I have been working in the field of NMR-based environmental metabolomics focusing on organisms of ecotoxicological relevance (e.g. small fish). Specifically, this work is directed toward the determination of markers of exposure in these organisms for chemical stressors of regulatory significance.

BIOGRAPHICAL SKETCH

NAME: J. Jackson Ellington

POSITION TITLE: Research Chemist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Berry College	B.A	1966	Chemistry
University of Georgia	Ph.D.	1974	Medicinal Chemistry

PROFESSIONAL EXPERIENCE

1978 to present Research Chemist, Environmental Research Division, National Exposure Research Laboratory, U.S.Environmental Protection Agency, Athens, GA.

1974 to 1978 Research Chemist, Tobacco and Health Laboratory, Russell Research Center, U.S. Department of Agriculture, Athens, GA.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Chemical Society

SELECTED AWARDS AND HONORS

EPA Gold Medal for Exceptional Service for innovative technical leadership in providing information essential to implementing the Land Disposal Decision Rule, January 1987.

Scientific and Technological Achievement Award (STAA) Level II Award for journal article *GC/FT-IR Analysis of the Thermally Labile Compound Tris(2,3-dibromopropyl) Phosphate*, 1990.

EPA Bronze Medal as member of the Laboratory's Pathway Analysis Team for its work in providing chemical behavior information in support of the Hazardous Waste Identification Projects, 1994.

EPA Bronze Medal Commendable Service for initiative and ingenuity in developing sample preparation techniques, analysis protocols and QA/QC procedures for analysis of perchlorate in environmental matrices, 2001.

STAA Level III award for *Determination of perchlorate at parts-per-billion levels in plants by ion chromatography* (J. Ellington) 2002.

STAA Level II award for *Accumulation of Perchlorate in Tobacco Plants: Development of a Plant Kinetic Model* (J. Ellington) 2004.

INVITED LECTURES/SYMPOSIA

Ellington, J.J. and R.V. Thurston. Results of Studies of Xenobiotic Chemicals in the Nemunas River Basin. Presented at the USA-Baltics Workshop on Environmental Chemistry, Palanga Lithuania, June 11-15, 1997.

Ellington, J.J.* and Evans, Method for the Determination of Perchlorate Anion in Plant and Solid Matrices by Ion Chromatography. SETAC meeting, Baltimore, MD, November 11-15, 2001.

Ellington*, J.J. and Wolfe, N.L., Phytoremediation: Using Plants to Clean Up Contaminated Soil, Groundwater, and Wastewater. First Baltic Symposium on the Environment, Tallinn, Estonia, September 26-29, 2001.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Ellington, J.J. and R.V. Thurston. Results of Studies of Xenobiotic Chemicals in the Nemunas River Basin. Presented at the USA-Baltics Workshop on Environmental Chemistry, Palanga Lithuania, June 11-15, 1997.

1996 to Present: Member of the Research Laboratory Technology State of Georgia Technical Committee. Participated in the Contextual Curriculum Development Project held at Kennesaw State University with representatives from Athens Area Technical Institute, Kennesaw State and the American Chemical Society.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

1995 to Present: Member of the Agency Octanol/Water Partition Coefficient (K_{ow}) Workgroup. Participated in formulation of draft Guidance for Determining Octanol/Water Partition Coefficients (K_{ow}) for Compounds with $\log K_{ow}$ Values >5. Reviewed Office of European Organization for Economic Development (OECD) Guideline 107 for determination of $\log K_{ow}$ s by the slow-stirring method, Guideline 117 for estimation of the octanol/water partition coefficient by high performance liquid chromatography (HPLC), and the proposed pH-metric guideline for ionizable substances.

1995 to Present: Member of the Agency MTBE-Water Research Task Group that developed a strategy for oxygenates in water. Contributing author of the Task Force report Research Strategy for Oxygenates in Water (EPA/600/R-98/048). This document addressed the concerns of fate, exposure, and human health and ecosystem health risks posed by release of fuel oxygenates such as methyl tertiary butyl ether (MTBE) into the environment.

PUBLICATIONS

Richardson, S.D., Collette, T.W., Price, P.C., Genicola, F., Jenks, J.W., Thruston Jr., A.D., and Ellington, J.J. 1999. Identification of Drinking Water Contaminants in the Course of a Childhood Cancer Investigation in Toms River, NJ. *J. of Exposure Analysis and Environmental Epidemiology*. 9(3) 200-216.

Garrison, A.W., Nzungu, V.A., Avants, J.K., Ellington, J.J., Jones, W.J., Rennels, D., and Wolfe, N.L. 2000. The Phytodegradation of p,p'-DDT and the Enantiomers of o,p'-DDT. *Environ. Sci. Technol.* 34, 1663-1670.

Ellington, J.J. 1999. Octanol/Water Partition Coefficients and Water Solubilities of Phthalate Esters. *J. Chem. Eng. Data*. 44(6) 1414-1418.

Ellington, J.J. and Evans, J.J., 2000. Determination of Perchlorate at Parts-per-billion Levels in Plants by Ion Chromatography. *J. Chromatogr. A*, 898, 193-199.

Ellington, J.J., Wolfe, N.L., Garrison, A.G., Evans, J.J., Avants, J.K., and Teng, Q., 2001. Accumulation of Perchlorate in Tobacco Plants and Tobacco Products. *Environ. Sci. Technol.* 35, 3213-3218.

Ellington, J.J., Evans, J.J., Prickett, K.B., and Champion, W.L. Jr., 2001. High Performance liquid chromatographic resolution of the enantiomers of organophosphate insecticides on polysaccharide chiral stationary phases. *J. Chromatogr. A*, 928, 145-154.

Sundberg, S.E., Ellington, J.J., Evans, J.J., Keys, D.A., and Fisher, J.W., 2003. Accumulation of perchlorate in tobacco plants: development of a plant kinetic model. *J. Environ. Monitor.* 5, 505-512.

Sundberg, S.E., Ellington, J.J., Evans, J.J., A simple and fast extraction method for organochlorine pesticides and polychlorinated biphenyls in small volumes of avian serum. *J. Chromatog. B*, 831, 99-104.

NARRATIVE

Current research is dedicated to occurrence and degradation of perfluorinated chemicals and polymers.

BIOGRAPHICAL SKETCH

NAME: Anne Fairbrother

POSITION TITLE: Research Ecologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Univ. of California, Davis	B.S.	1976	Wildlife Biology
Univ. of California, Davis	D.V.M. Ph.D.	1980	Veterinary Medicine
Univ. of Wisconsin, Madison		1985	Wildlife Diseases

Professional Experience

1999-2002: Director, Terrestrial Ecotoxicology, Parametrix, Inc., Corvallis, OR

1994-1999: Senior Wildlife Ecotoxicologist, ecological planning and toxicology, inc.

1992:1994: Chief, Ecotoxicology Branch, USEPA, ERL, Corvallis, OR

1986-1992: Scientist, USEPA, ERL, Corvallis, OR

Professional Societies & PUBLICATION BOARDS

American Veterinary Medical Association (Committee Chair)

American Association of Wildlife Veterinarians (Board, President)

Society of Environmental Toxicology and Chemistry (Board, President)

The Wildlife Society

Wildlife Disease Association (Council, President)

SELECTED AWARDS AND HONORS

USEPA Science and Technology Achievement Award, 2005

USEPA Gold Medal, 2005

USEPA Bronze Medal 2005

USEPA Bronze Medal, 1992

USEPA Innovative Research Program Award, 1990

USEPA Technical Achievement Award, 1990

Distinguished Service Award, Wildlife Disease Association, August 2002

Adjunct Professor, Department of Environmental and Molecular Toxicology, Oregon State University, 2003 - present

Associate Professor (courtesy) College of Veterinary Medicine, Oregon State University 1987-2000

SELECTED INVITED LECTURES/SYMPOSIA

Society of Environmental Toxicology and Chemistry Pellston Workshop on Biomarkers, July, 1989, Keystone, CO.

Society of Environmental Toxicology and Chemistry Pellston Workshop on the Population Ecology and Wildlife Toxicology of Agricultural Pesticide Use: A Modeling Initiative for Avian Species, July, 1990, Kiawah Island, SC.

Fairbrother, A. Clinical Biochemistry. Workshop on nondestructive biomarkers in vertebrates, May, 1992, Siena, Italy.

Fairbrother, A. Ecotoxicological Principles for Avian Field Studies. SETAC Pellston Workshop on Radiotelemetry for

Avian Field Studies, January, 1993, Asilomar, CA.

Workshop on Test Technologies for Review of Chemicals in Commerce. Office of Technology Assessment, United States Congress, April, 1995, Washington, DC.

Risk Assessment of Multiple Stressors in Ecosystems. A Pellston Workshop sponsored by the Society of Environmental Toxicology and Chemistry, Sept., 1997, Pellston, MI.
Workshop on Environmental Risk Methodologies for Metals and Inorganic Metal Compounds. October, 1999, Montpellier, France.
Workshop on Low-dose, High-potency Herbicides. Convened by the International Life Sciences Institute (ILSI). December 1999, Washington, DC.
Society of Environmental Toxicology and Chemistry Pellston Workshop on Uncertainty in Risk Assessment. February 2002, Pensacola, FL.
Workshop on Ecotoxicogenomics. September 2002, Pensacola, FL.
Society of Environmental Toxicology and Chemistry Pellston Workshop on Persistence, Bioaccumulation, and Toxicity of Metals, May 2003, Pensacola, FL.
Workshop on assessment of long term risks of pesticides to birds and mammals. Convened by Central Science Laboratory, DEFRA, January 2004, York UK.
Risk Assessment in a modeling context. Convened by Dept. of Fisheries and Wildlife, Oregon State University, January 2005, HJ Andrews Experimental Forest, OR.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Ecological Technical Advisory Panel, International Metals Consortium, 1995-present
Contaminated Soils Advisory Group, Society of Environment Toxicology and Chemistry, 1996-present
Board of Scientific Counselors, Office of Research and Development, USEPA, 2001-present
Science Advisory Panel for Soil Toxicity Criteria, British Columbia Ministry of Environment, 1996
Peer Review Panel for Ecotoxicity Threshold Values, Superfund Program, USEPA, 1995
Blue Ribbon Peer Review Panel, U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center, 1990-1991
National Research Council Committee Member, Use of Animals as Indicators of Environmental Health Hazards, 1988-1991

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Morris et al. 2006. EPA Nanotechnology White Paper (in review)
Fairbrother, A., R. Wentsel, and K. Sappington. 2006. Framework for Metals Risk Assessment (in review)
Gallagher, K., Benson, W.H., Brody, M., Fairbrother, A., Hasan, J., Klaper, R., Lattier, D., Lundquist, S., McCarroll, N., Miller, G., Preston, J., Sayre, P., Seed, J., Smith, B., Street, A., Troast, R., Vu, V., Reiter, L., Farland, W.,
Dearfield, K. 2006. Genomics: Applications, Challenges and Opportunities for the U.S. EPA. Hum. Ecol. Risk Assess. 12(3):572-590
Workgroup on viral coat protein-plant incorporated protectants exemption rule, 2003 – present
Federal Advisory Committee for Endocrine Disruptor Methods Validation, 2004 – present
US Environmental Protection Agency Peer Review Panel, Ecological Risk Assessment Guidelines, 1995
Science Advisory Panel (Pesticides), USEPA, 2001

Science Advisory Committee, USEPA, Center of Excellence in Ecotoxicology, University of California, Davis, 1992-1998

Publications

(Selected)

Glicken, J., and A. Fairbrother. 1998. Environment and social values. *Human and Ecol. Risk Assessment*. 4:779-786.

Fairbrother, A., and R. S. Bennett. 1999. Ecological risk assessment and the precautionary principal. *Human and Ecol. Risk Assessment*. 5:943-950.

Fairbrother, A., K. V. Brix, J. E. Toll, S. McKay, and W. J. Adams. 1999. Egg selenium concentrations as predictors of avian toxicity. *Human and Ecol. Risk Assessment*. 5:1229-1253.

Fairbrother, A., K.V. Brix, D.K. DeForest, and W.J. Adams. 2000. Egg selenium thresholds for birds: a response to J. Skorupa's critique of Fairbrother et al., 1999. *Human and Ecol. Risk Assessment*. 6:203-212.

Fairbrother, A. 2000. Comparative aspects of estrogen functions and measurements in oviparous and viviparous vertebrates. *Human and Ecol. Risk Assessment*. 6:73-102.

Adams, W.A., K.V. Brix, M. Edwards, L.M. Tear, D.K. DeForest, and A. Fairbrother. 2003. Analysis of field and laboratory data to derive selenium toxicity thresholds for birds. *Environ. Toxicol. Chem.* 22(9):2020-2029.

Brewer, L., A. Fairbrother, J. Clark, and D. Amick. 2003. Acute toxicity of lead, steel, and an iron-tungsten-nickel shot to mallard ducks (*Anas platyrhynchos*). *J. Wildl. Dis.* 39(3):638-648.

Fairbrother, A. 2003. Lines of evidence in ecological risk assessment. *Human Ecol. Risk Assess.* 9:1475-1491.

Fairbrother, A., J. Smits, and K. Grasman. 2004. Avian immunotoxicology. *J. Toxicol. Environ. Hlth, Part B.* 7:105-137.

Watrud, L.S., E.H. Lee, A. Fairbrother, C. Burdick, J.R. Reichman, M. Bollman, M. Storm, G. King, and P.K Van de Water. 2004. Evidence for landscape-level, pollen-mediated gene flow from genetically modified creeping bentgrass with CP4 EPSPS as a marker. *Proc. Natl. Acad. Sci. USA.* 101(40): 14533-14538.

Clark, J., L. Oretgo, and A. Fairbrother. 2004. Sources of variability in plant toxicity testing. *Chemosphere: Environ. Toxicol. Risk Assess.* 57:1599-1612

Suter II, G.W., S.B. Norton, and A. Fairbrother. 2005. Individuals versus organisms versus populations in the definition of ecological assessment endpoints. *Integrated Environ. Assess. Mgmt.* 1:397-400.

Bennett, R.S., I. Dewhurst, A. Fairbrother, A. D. M. Hart, M. Hooper, A. Leopold, P. Mineau, S. Mortensen, R. F. Shore and T. A. Springer. 2005. A new interpretation of avian and mammalian reproduction toxicity test data in ecological risk assessment. *Ecotoxicol.* 14(8):1-15

Nagy, L.R., A. Fairbrother, J. Orme-Zavaleta, and M. Etterson. (in press). The intersection of independent lies in ecological risk assessment. *Hum. Ecol. Risk Assess.*

BIOGRAPHICAL SKETCH

NAME: M. Cathy Fehrenbacher

**POSITION TITLE: Chief, Exposure
Assessment Branch**

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Lamar University, Beaumont, TX	B.S.	1982	Environmental Science
Texas A&M University, College Station, TX	M.S.	1984	Industrial Hygiene
University of Maryland, College Park, MD		1990	System Safety

PROFESSIONAL EXPERIENCE

April, 1997 to Present. Chief, Exposure Assessment Branch. U.S. Environmental Protection Agency (EPA), Office of

Pollution Prevention and Toxics (OPPT), Washington, DC.

March, 1992 to April, 1997. Senior Industrial Hygienist, Chemical Engineering Branch. U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, Washington, DC.

March 1987 to March, 1992. Industrial Hygienist, Chemical Engineering Branch. U.S. Environmental Protection Agency, Office of Toxic Substances, Washington, DC.

February, 1986 to March, 1987. Industrial Hygiene Programs Coordinator, Safety, Health, and Environmental Management Division. U.S. Environmental Protection Agency, Office of Administration and Resources Management, Washington, DC.

August, 1985 to February 1986. Industrial Hygienist, Chemical Engineering Branch. U.S. Environmental Protection

Agency, Office of Toxic Substances, Washington, DC.

May, 1984 to August, 1985. Legal Assistant. Mehaffy, Weber, Keith & Gonsoulin. Beaumont, Texas.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Diplomate, American Board of Industrial Hygiene. Certification in the Comprehensive Practice of Industrial Hygiene. Certificate Number 4036 CP. Expires June 1, 2011.

Member, American Industrial Hygiene Association (AIHA).

Member, American Conference of Governmental Industrial Hygienists.

SELECTED AWARDS AND HONORS

Vice Presidential Hammer Award for Reinvention Projects – Use and Exposure Information. 1997.

EPA Bronze Medal for Commendable Service. For exemplary efforts to reduce serious hazards and potential risks associated with PFOA/PFOS chemicals. 2006

EPA Bronze Medal for Commendable Service. In recognition of the successful negotiation of two PFOA monitoring Memorandum of Understanding (MOUs) 2005

EPA Bronze Medal for Commendable Service. In recognition for the development and successful implementation of a process to review and comment on chemical Test Plans submitted under the HPV Challenge Program

EPA Bronze Medal for Commendable Service. For outstanding efforts and significant contributions to the development of format and guidance for presenting exposure information submitted under the Voluntary Children's Chemical Evaluation Program (VCCEP)

EPA Bronze Medal for Commendable Service. For outstanding participation in the OECD Ad Hoc Expert Group on Reporting Exposure Information and for exceptional contributions to developing the Group's formats and guidance

EPA Bronze Medal for Commendable Service. For designing and implementing a program to voluntarily collect data

on use and exposure from chemical manufacturers.

EPA Bronze Medal for Commendable Service. In recognition of your contribution to the elimination of the New Chemical Follow-up Backlog.

EPA Bronze Medal for Commendable Service. For outstanding contributions to the Development and Promulgation of the Expedited New Chemical Follow-up Rule.

EPA Bronze Medal for Commendable Service. For developing the polymer exemption as a mechanism for streamlining the review of new polymers under the PMN program.

EPA Bronze Medal for Commendable Service. In recognition of outstanding work in implementing the Agency's Risk

Characterization Guidance within OPPT in order to achieve better risk assessment and risk management decisions.

EPA Bronze Medal for Commendable Service. For innovating thinking and exceptional achievement in promulgating

the PMN Rule Amendments. This effort demonstrated OPPT's commitment to reducing burden on government and industry while enhancing environmental protection.

INVITED LECTURES/SYMPOSIA

Global Chemical Regulations Conference. Invited Speaker at the Working within the Value Chain session. Working

Within the Value Chain – VCCEP Exposure Assessments, March 29, 2006.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Member, Risk Assessment Committee, AIHA.

Member, Potomac Local Section of the AIHA. Past Member of the Board of Directors.

Past Chair, Exposure Assessment Strategies Committee, AIHA. Actively participated in the Modeling Subcommittee. The Committee received an award from the AIHA as one of the top ten committees the year that I served as Chair.

Past Member of the Editorial Board, American Industrial Hygiene Association Journal.

Instructor of Professional Development Courses:

October 20, 1995. Assessing Future Exposures – The TSCA New Chemicals Program.” AIHA Chesapeake Section Professional Conference. Baltimore, MD.

May 22, 1994. “Strategies for Occupational Exposure Assessment and Statistics.” American Industrial Hygiene Conference and Exposition. Anaheim, CA.

May 16, 1993. “Strategies for Occupational Exposure Assessment and Statistics.” American Industrial Hygiene Conference and Exposition. New Orleans, LA.

May 31, 1992. A Toolbox of Mathematical Models.” American Industrial Hygiene Conference and Exposition. Boston, MA.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Serves as the primary technical lead negotiator for OPPT on the Perfluorooctanoic acid Enforceable Consent Agreement (ECA) process. Served as the technical lead in negotiating the terms of two Monitoring Memoranda of Understanding with two companies, and terms for voluntary testing of aged articles made with or manufactured from perfluorinated compounds. Also served as the technical lead negotiating the terms of voluntary biodegradation testing by industry, and for the Fluorotelomer-based Product Biodegradation Testing Supplemental Environmental Project (Biodegradation SEP). Coordinates with EPA's Office of Research and Development (ORD) in support of biodegradation and article research in their support of OPPT's efforts regarding perfluorinated compounds. Served as the technical lead for development of the environmental sections of the draft OECD PFOA SIAR document and coordinates with Canada and OECD member countries on the exposure and environmental fate of perfluorinated compounds.

Serves as a representative to the Research Coordination Team for research related to exposure assessment and environmental fate and transport in support of OPPT programs.

Supervises staff and participates in Agency efforts to develop voluntary programs and implement rulemaking efforts in support of the Toxic Substances Control Act.

Serves as a United States delegate to the OECD Environmental Exposure Assessment Task Force. Served as the Chair of the OECD Ad Hoc Group that developed the Summary Exposure Reporting Format for existing chemicals.

Serves as the EPA technical lead for the SAB Peer Review of the EPI Suite™ model (ongoing.)

Supervised the development and implementation of human and environmental exposure, and fate and transport methods, models and databases. These models and databases are widely used by academia, industry, government agencies, and researchers and consultants both domestically and internationally. These models include the Exposure, Fate Assessment Screening Tool (E-FAST), the Multi-Chamber Concentration and Exposure Model (MCCEM), the Wall Paint Exposure Model (WPEM), the Indoor Air Source Ranking Database (SRD), the Estimation Programs Interface Suite (EPI Suite™), the Internet Geographical Exposure Modeling System, and the update of ReachScan, a drinking water model (under development.)

Developed and implemented the initial industrial hygiene practices and policies for the Chemical Engineering Branch of OPPT. This included the appropriate selection and use of respiratory protection and chemical protective clothing, development of the New Chemical Exposure Limits program, and development of generic scenarios for assessing worker exposure and environmental release for new chemical substances. New Chemicals are submitted for Agency review under TSCA at least ninety days prior to commercialization. Because these chemicals have not yet been commercialized, very little information exists with respect to hazards and exposure. The industrial hygiene practices and policies were based on the best science available and were consistent with good industrial hygiene practice but went beyond the current regulatory requirements in other programs. For example, the respiratory protection policy included respirator cartridge testing which has since become standard industrial hygiene practice under the Occupational Safety and Health Administration regulations. The chemical protective clothing policy include glove permeation testing where appropriate, to demonstrate that chemicals would not permeate through protective gloves, as well as practices for use of protective clothing based on the testing. The development and use of generic scenarios has now become standard practice, and is one of the main areas of emphasis of the OECD Environmental Exposure Assessment Task Force. The generic scenarios developed by the United States have become widely recognized by international professionals.

PUBLICATIONS

- M. Cathy Fehrenbacher, Fred Arnold, Hans Marquardt, and Paul G. Evans. *Approaches for Occupational Dermal Exposure Assessment and Management*. The Occupational Environment: It's Evaluation, Control, and Management. 2nd Edition. Salvatore R. Dinardi, Editor. AIHA Press. 2003.
- M. Cathy Fehrenbacher and Wil F. Ten Berge. Chapter 10. *Dermal Exposure Modeling*. Mathematical Models for Estimating Occupational Exposure to Chemicals. Charles B. Keil, Editor. AIHA Press. 2000.
- M. Cathy Fehrenbacher. Respiratory Protection. Engineering Field Reference Manual. Second Edition. Fredric N. Bolton and David L. Johnson, Editors. AIHA Press. 2000.
- Joseph Damiano, John R. Mulhausen. Contributing author to Appendix II. *Dermal Exposure Assessments*. A Strategy for Assessing and Managing Occupational Exposures. AIHA Press. 1998.
- J. Thomas Pierce, M. Cathy Fehrenbacher, and Lutz W. Weber. *Dermal Exposure and Occupational Dermatoses*. The Occupational Environment: It's Evaluation, Control, and Management. Salvatore R. Dinardi, Editor. AIHA Press. 1997.
- M.C. Fehrenbacher, A. A., Hummel. "Evaluation of the Mass Balance Model Used by EPA for Estimating Inhalation

- Exposure to New Chemical Substances.” *Am. Ind. Hyg. Assoc. J.* June, 1996.
- A.A. Hummel, K. O. Braun, and M.C. Fehrenbacher. “Evaporation of a Liquid in a Flowing Air Stream.” *Am. Ind. Hyg. Assoc. J.* June, 1996.
- Organization for Economic Cooperative Development. “Approaches for Developing Screening Quality Estimates of Occupational Exposure Used by the U.S. EPA’s Office of Pollution Prevention and Toxics, and their Applicability to the OECD SIDS Programme.” OECD Environment Moographs, No. 70. Occupational and Consumer Exposure Assessments. Annex I, pp. 15-34. Paris, 1993.
- M.C. Fehrenbacher. “The Environmental Protection Agency’s Use of Occupational Exposure Databases for Screening Level Assessments under the Toxic Substances Control Act.” *Appl. Occup. Environ. Hyg.* 10(4), pp. 374-378. April, 1995.

BIOGRAPHICAL SKETCH

NAME: Suzanne Fenton

POSITION TITLE: Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Wisconsin, Madison, WI	B.S.	1984-88	Dairy Science/Pre-Vet
University of Wisconsin, Madison, WI	M.S.	1988-90	In Vitro Fertilization and gamete biology
University of Wisconsin, Madison, WI	Ph.D.	1990-93	Mammary gland signal transduction
University of North Carolina, Chapel Hill, NC	Post-doc	1993-98	Mammary gland carcinogenesis

PROFESSIONAL EXPERIENCE

1992 Lecturer; University of Wisconsin-Madison
10/98-present Research Biologist; U.S. EPA, National Health Effects Environmental Research Laboratory, Reproductive Toxicology Division, Developmental Biology Branch
1/03-present Adjunct Graduate Faculty at UNC-Chapel Hill-School of Public Health
6/03-present Adjunct Graduate Faculty at NCCU, Departments of Biology and Chemistry
11/05-present Adjunct Graduate Faculty at UNC-Chapel Hill-Curriculum in Toxicology
2003- Editorial Board, *Developmental and Reproductive Toxicology*

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Society for Cell Biology (1996-7)
American Association for Cancer Research (1996-8)
American Association for the Advancement of Science (AAAS, 1997-2005)
N.C. Society of Toxicology (1999-)
Society of Toxicology, Full Member (2001-)
SOT Repro Devel Toxicology Specialty Section (2001-)
SOT Women in Toxicology Specialty Section (2001-)

SELECTED AWARDS AND HONORS

National Cancer Institute NRSA grant recipient, University of North Carolina, Chapel Hill, NC
Office of Pesticides Programs Health Effects Division Team Award - Atrazine
Numerous S-awards for service to the Division/NHEERL/EPA
EPA STAA Level III Award; 2004, 2004
NHEERL Goal 3 Science Award, 2005
NHEERL Diversity Award; 2005 (Mentorship)
CRADA #0176-99, Project Manager. Development of Toxicology/Stress DNA Microarrays
Recipient of funding from National Children's Study for Methods Advancement for Milk Analysis
NHEERL Minority Training Awards for RTD graduate student training
Paper of the Year Award – *Toxicological Sciences* – RDTSS at 2006 SOT (Rayner et al., 2005)

INVITED LECTURES/SYMPOSIA

7/03 University of WI-Madison, ERPP Distinguished Alumni seminar, *The Alumni Perspective: Careers in Government*
11/03 National Children's Study Pilot Review, RTP, NC, *Methods Advancement in Milk Analysis (MAMA Study)*
3/04 Fifth Annual Conference on Sex and Gene Expression (SAGE V), Winston-Salem, NC. *Long-term effects of*

- dioxin on reproductive development and sex determination@
- 6/04 Environmental Endocrine Disruptors Gordon Conference, Colby-Sawyer College, NH. ALong-term Effects of
of
Prenatal Exposures to EDCs on the Mammary Gland of the Female Rat.@
- 7/04 Washington State University, Department of Toxicology, Pullman, WA, APrenatal Environmental
Exposures
and Altered Mammary Tissue Development@
- 3/05 2005 SOT talk entitled, “Influence of Endocrine Disrupting Compounds (EDCs) on Mammary Gland
Development and Tumor Susceptibility”
- 4/05 Atrazine Workshop, Iowa City, IA – “Gestational Atrazine Exposure in the Rat: Effects on Mammary Gland
Development and Function in Multiple Generations”.
- 6/05 Endocrine Society’s EDC Forum– San Diego, CA; “Novel effects of dioxin on breast development, function,
and susceptibility to cancer”.
- 9/05 9th Annual ICEM/EMS International Meeting, San Francisco, CA; “Environmental Estrogens as Cancer
Risk
Factors”.
- 11/05 ISEA International Meeting, Tucson, AZ; “Methods Advancement in Milk Analysis: The MAMA Study”.
- 7/06 Perfluoroalkyl Acid (PFAA) Days, Research Triangle Park, NC, “Effects of PFOA developmental exposure
on reproductive tissues”
- 9/06 American Association of Birth Centers, 22nd Annual Meeting, Valley Forge, PA; “Environmental
Components Found in Breast Milk: Findings from the MAMA Study”.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

- 2003-Present Ad Hoc reviewer: Endocrinology, Biology of Reproduction, Toxicological Sciences, Environmental
Health Perspectives, Toxicological Pathology, Fertility & Sterility, Toxicology and Applied
Pharmacology, Reproductive Toxicology, and Environmental Research.
- 2002-2005 Core Member, National Children’s Study, AEarly Origins of Adult Health@group
- 8/02-11/05 Member, Study Assembly of the Longitudinal Cohort Study of Environmental Effects on
Child Health and Development;
- 06/03 Office of Women’s Health Forum Panelist, Washington, D.C., AWorkshop on Breast Cancer and the
Environment@
- 07/03 Scientific Reviewer for NIH ES 03-001, Breast Cancer and Environment Research Centers
- 11/03 Serono Symposium Panelist, Chicago, IL, ARole of Environmental Factors on the Onset and
Progression of Puberty Expert Panel Workshop@(declined panelist invitation, attended as observer).
- 9/04 Lead of Exposure Working Group, Hershey, PA, AExpert Panel on Human Milk Surveillance and
Biomonitoring for Environmental Chemicals in the United States@
- 2005-Present Consultant to NIEHS/NIH grant – PI lead, B. Paige Lawrence (R01 ES013958; awarded 8/05)
- 3/05 Session Chair 2005 SOT. AEnvironmental Effects on Breast Cancer Susceptibility@
- 7/05 Session Chair 2005 SSR “Effects of the Environment and Nutrition on Development and Female
Reproduction”
- 9/05 International Cancer Cohort Workshop, Washington, D.C., National Children’s Study
- 11/05-6/06 National Children’s Study Biological Sample Collection Panel
- 12/05 Scientific Reviewer for NIEHS K23 awards
- 2006-Present Consultant to NIEHS grant – PI lead, Beth Vorderstrasse (R21 ES14422-01, awarded 1/06)
- 1/06-4/06 Program committee SOT RDTSS
- 5/06 Expert Panelist, Raleigh, NC, “NTP’s Rodent Models for Hormonally-Induced Reproductive
Tumors Workshop” – served on the Mammary Gland Panel.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

- 2001-2004 Member, Performance and Recognition Committee, RTD
- Nov. 2005- RTD representative on NHEERL Quality Assurance Management Committee

2/01-	EDC Implementation Plan - investigator GPRA Goal 4
2/02-	Human Health Research (HHR) Implementation and Multiyear Plan – investigator
10/02-	RTD Theme Leader for NCS projects in HHR Multiyear Plan
4/04-	SP2 Implementation and Multiyear Plan – project co-leader
4/05	OPPTS Program Office Briefing - Atrazine
12/05	OPPT Program Office Briefing - PFOA

PUBLICATIONS (Out of over 45)

1. Birnbaum, L.S. and S.E. Fenton. 2003. Cancer associated with developmental exposures to endocrine disruptors. *Environ. Health Perspect.* 111:389-394.
2. Rayner, J.L. C. Wood, and S.E. Fenton. 2004. Exposure parameters necessary for delayed puberty and mammary gland development in Long-Evans rats exposed in utero to atrazine. *Toxicol. Appl. Pharmacol.* 195:23-34.
3. Vorderstrasse, B. S.E. Fenton, A.A. Bohn, J.A. Cundiff, and B.P. Lawrence. 2004. A novel effect of dioxin: exposure during pregnancy severely impairs mammary gland differentiation. *Toxicol. Sci.* 78 (2):248-257.
4. Rayner, J.L., R.R. Enoch, and S.E. Fenton. 2005. Adverse effects of prenatal exposure to atrazine during a critical period of mammary gland growth. *Toxicol Sci* 87:255-266.
5. S.E. Fenton, M. Condon, A.S. Ettinger, J.S. LaKind, A. Mason, M. McDiarmid, Z. Qian, S.G. Selevan. 2005. Collection and Use of Exposure Data from Human Milk Biomonitoring in the United States. *J Toxicol Environ Health Part A* 68:1691-1712.
6. C.M. Berlin, Jr., J.S. LaKind, S.E. Fenton, et al., 2005. Conclusions and Recommendations of the Expert Panel: Technical Workshop on Human Milk Surveillance and Biomonitoring for Environmental Chemicals in the United States. *J Toxicol Environ Health Part A* 68:1825-1831.
7. Khan, M.A., S.E. Fenton, A.E. Swank, S.D. Hester, and D.C. Wolf. 2005. A mixture of ammonium perchlorate and sodium chlorate enhances alterations of the pituitary-thyroid axis caused by the individual chemicals in adult male F344 rats. *Toxicol. Path.* 33:776-783.
8. X-J. Wang, E. Bartolucci-Page, S.E. Fenton, and L. You. 2006. Altered mammary gland development in male rats exposed to genistein and methoxychlor. *Toxicol. Sci.*(Jan 27 Epub).
9. S.E. Fenton. 2006. Endocrine Disrupting Compounds and Mammary Gland Development: Early exposure and later life consequences. *Endocrinology* 147(Supplement):S18-S24.
10. S.E. Fenton and L.G. Sheffield. Prolactin-induced tyrosine phosphorylation, activation and receptor association of focal adhesion kinase (FAK) in mammary epithelial cells: Critical involvement of JAK2 and c-src activation. *J. Biol. Chem* (Accepted with revision).
11. Hines, E.P., Rayner, J.L., Barbee, R., Moreland, R.A., Valcour, A., Schmid, J.S., and S.E. Fenton. Assays for Endogenous Components of Human Milk: Comparison of Fresh and Frozen Samples in Corresponding Endpoints in Serum. (Submitted to *J Human Lactation*; 6-06).
12. Rayner, J.L., R.R. Enoch, D.C. Wolf, and S.E. Fenton. Atrazine-induced reproductive tract alterations after transplacental and/or lactational exposure in male Long-Evans rats. (*Toxicol Appl Pharmacol*; in press)
13. Enoch, R.R., J.S. Stanko, S.N. Greiner, G.L. Youngblood, J.L. Rayner, and S.E. Fenton. Mammary Gland Development as a Sensitive End-Point Following Acute Prenatal Exposure to a Low Dose Atrazine Metabolite Mixture in Female Long Evans Rats. (Submitted to *Environ. Health Perspect.*; 8-06)
14. C.J. Wolf, S.E. Fenton, J.E. Schmid, A.M. Calafat, Z. Kuklennyik, J. Thibodeaux, K. Das, S.S. White, C. Lau and B.D. Abbott. Developmental Toxicity of perfluorooctanoic acid (PFOA) after Cross Foster and Restricted Gestational Exposures. (Submitted to *Toxicol. Sci.*; 9-06)
15. S.S. White, A.M. Calafat, Z. Kuklennyik2, J. Thibodeaux, C. Wood, and S.E. Fenton. Gestational PFOA Exposure of Mice is Associated with Altered Mammary Gland Development in Dams and Female Offspring. (Submitted to *Toxicol. Sci.*; 9-06)
16. M.S. Pooler, E.P. Hines, M. Hoopes, R. Hanson, J.S. Schmid, and S.E. Fenton. The effects of atrazine and its metabolites on the proliferation and differentiation of HC11 mammary epithelial cells. (Submitted for clearance; 9-06)
17. J.L. Rayner, E.P. Hines, and S.E. Fenton. Effects of atrazine and its metabolites on functional differentiation

of the rat mammary gland during late pregnancy and early life effects in offspring following acute prenatal exposure. (submitted internal review; 9-06)

18. J.L. Rayner, E.P. Hines, and S.E. Fenton. Comparative disposition of atrazine and an atrazine metabolite mixture in the pregnant and lactating rat. (submitted for internal review; 9-06)

BIOGRAPHICAL SKETCH

NAME: Elaine Z. Francis

**POSITION TITLE: National Program Director for
Pesticides and Toxics Research Program**

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
The American University	B.S.	1972 (Dec.)	Biology
Thomas Jefferson University	Ph.D.	1978	Anatomy

PROFESSIONAL EXPERIENCE

National Program Director for Pesticides and Toxics Research Program	2005-present
National Program Director for Endocrine Disruptors Research Program	2000-2005
Director, Toxics/Pesticides and Multimedia Staff	1997- 2000
Director, Toxics & Pesticides Staff	1995-1997
Director, Toxics/Pesticides & Water Regulatory Support Staff	1994-1995
Director, Toxics & Pesticides Regulatory Support Staff	January 1992-1994
Developmental and Reproductive Toxicologist	July 1988- Jan. 1992
LEGIS Fellow, U.S. Senator Joseph I. Lieberman	Jan.-Dec. 1991
Acting Branch Chief, Reproductive & Developmental Toxicology Branch	Jan.-July 1990
Developmental & Reproductive Toxicologist	July 1980-July 1988
Office of Pesticides and Toxic Substances (OPTS)	
Special Assistant, Assistant Administrator, OPTS	Sept. 1985- Feb. 1986
Senior Instructor, Department of Anatomy, The Hahnemann Medical College	Aug. 1978-May 1980
Postdoctoral Fellow, Departments of Anatomy, Genetics, and Obstetrics-Gynecology, Thomas Jefferson University	Oct. 1977-Aug. 1978
Graduate Student, Department of Anatomy, Thomas Jefferson University	Sept. 1973-Oct. 1977
Biological Research Assistant, Laboratory of Toxicology, Division of Chemotherapy, National Cancer Institute	Sept. 1972-May 1973

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Teratology Society - 1977-present; Education Committee 1986-1989; Public Affairs Committee 1989-1992; Publications Committee – 2006-2009; Program Committee for 1991 annual meeting; Treasurer 1992-1998
Neurobehavioral Teratology Society - 1977-1979; 1989-1998
American Association for the Advancement of Science - 1978-present

SELECTED AWARDS AND HONORS

9 EPA Bronze Medals – '84, '86, '95, '97 (2), '99, '02, '04 (2)
EPA Silver Medal – negotiating Declaration of G-8 Environmental Leaders on children's environmental health '98
EPA Gold Medal – Risk Assessment Guidelines for Reproductive Toxicity '97
Dr. Joseph Seifter Award for Excellence in Regulatory Science '91
Science and Technology Achievement Award '91
Suzanne E. Olive National EEO Group Award - first environmental grants program on Tribal populations '03
Distinguished Alumni Award from Thomas Jefferson University College of Graduate Studies '01

INVITED LECTURES/SYMPOSIA (selected from a total of 70 since 2000)

Overview of USEPA's Endocrine Disruptors Research Program and Research/Interest in 'Emerging Contaminants'
Global Water Research Coalition Board of Trustees, Cincinnati, OH, November 7, 2006
Career Opportunities within the US Federal Government for Scientists. Boston University Biomolecular Department

Graduate Students Seminar Series. Boston, MA, October 25, 2006

Overview of USEPA's Endocrine Disruptors Research Program. Monitoring and Standards Workgroup of ASIWPCA, by teleconference, October 18, 2006

EPA's Endocrine Disruptors Research Program: Unique Among Research Organizations, EDCs STAR-EPA Workshop, Research Triangle Park, NC, July 13, 2006

PFAA: Extramural Support Through STAR, Fellowships, and SBIT Programs & Other Thoughts, Perfluoroalkyl Acids Days, Research Triangle Park, NC, July 11, 2006

Overview of USEPA's Endocrine Disruptors Research Program, Association of Government Toxicologists, Bethesda, MD, May 4, 2006

Overview of USEPA's Endocrine Disruptors Research Program, Workshop on Endocrine Toxicants: Ecological and Population Health Impacts, Ottawa, Canada, October 22, 2005

What are the USEPA's Programmatic/Regulatory and Research Interests in Endocrine Disruptors? Potomac River Basin Drinking Water Source Protection Partnership's Workshop on Emerging Contaminants and Water Supply, Shepherdstown, WV, September 19, 2005

Overview of USEPA's Endocrine Disruptors Research Program, House Appropriations Committee Staff, Washington, DC, June 16, 2005

Endocrine Disruptors: What Are They? What is EPA Doing to Address Them from a Regulatory and Research Perspective?, EPA Region 3, Philadelphia, Pennsylvania, May 24, 2005

USEPA's Extramural Grants and Fellowship Programs: Science to Achieve Results (STAR), Annual Society of Toxicology Meeting, New Orleans, LA, March 8, 2005

Overview of USEPA's Endocrine Disruptors Research Program, EU Workshop on International Collaboration on Endocrine Disruptors Research, Brussels, Belgium, January 26, 2005

US Environmental Protection Agency's Endocrine Disruptors Screening Program. European Teratology Society Meeting, Thessaloniki, Greece, September 20, 2004

US Environmental Protection Agency's Endocrine Disruptors Screening Program. Fresenius Academic Conference, Cologne, Germany, June 21, 2004

Coordinating Endocrine Disruptors Research Across Federal Agencies. Gordon Research Conference on Environmental Endocrine Disruptors, New Hampshire, June 6, 2004

US EPA's Endocrine Disruptors Programs: Ongoing National and International Collaborative Research Activities. WHO-Japan, Tokyo, Japan, December 9, 2003

USEPA's Endocrine Disruptors Programs: Regulatory and Research. 6th International Endocrine Disruptors Conference, Sendai, Japan, December 3, 2003

US EPA's Endocrine Disruptors Programs: Research and Regulatory. Water Environment Research Fund, Alexandria, VA, August 13, 2003; January 2004

EPA's Research Programs on Children's Health and Endocrine Disruptors. Women's Health and Environment Network Annual Workshop, Philadelphia, PA, April 22, 2003

Meet the Director: Science to Achieve Results. Society of Toxicology, Salt Lake City, UT, March 11, 2003

EPA's Extramural Research and Fellowship Programs. Society of Toxicology. Salt Lake City, UT, March 11, 2003

Research Needs for Endocrine Disruptors. NIEHS Children's Health Workshop, Bethesda, MD, Feb. 26, 2003

EPA's Research Program on Endocrine Disruptors. Briefing for Congresswoman Slaughter's staff, Washington, DC, May 30, 2002

Long Term Research Strategies for Endocrine Disruptors in the US Environmental Protection Agency. Society for Environmental Toxicology and Chemistry, Baltimore, MD, November 14, 2001.

Endocrine Disruptors: Why the Concern and What is Being Done to Address It? International Symposium on In Situ and On-Site Bioremediation, San Diego, CA, June 4, 2001

Environmental Research Issues for Developmental Toxicology, Thomas Jefferson University, Philadelphia, PA, April 24, 2001; April 22, 2003; April 20, 2004

Meeting Summary. International Workshop on Endocrine Disrupting Chemicals and Their Toxicological Evaluation, Tsukuba, Japan, March 3, 2001

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Interagency Working Group on Endocrine Disruptors - Chairperson - 2003-present

Biotechnology Research Working Group (Interagency) - 2001-present
Joint Consultation Group for US-EU Collaborations - 1999-present
Food Safety Research Interagency Working Group - 1997-2000
Food Safety Strategic Planning Working Group (Interagency) - 1998-2000
Food Safety Risk Assessment Consortium (Interagency) - 1999-2000
Federal Coordinating Committee on Breast Cancer - 1997-1999
Interagency Committee on Environmental Health Along the US/Mexico Border 1992-1997

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY (selected)

Safe Pesticides/Safe Products Research Planning Team – Chairperson – 2005-present
Endocrine Disruptors Priority Setting Working Group - 2002 – present
ORD Science Council – 2001- present
Multimedia Subcommittee on Endocrine Disruptors Research Planning - Chairperson - 2000- present
Multimedia (Goal 8) Research Coordination Team - Chairperson - 1997-2000
Toxics and Pesticides Research Coordination Team -Chairperson - 1995-2000
EPA Administrator’s Food Quality Protection Act 10X Taskforce 1998-1999
EPA Administrator’s Planning Team for the G-8 Environmental Leaders’ Summit - 1997
Coordinating Committee on Endocrine Disruptors - Chairperson - 1996-2000
Writing Team for Research Plan on Endocrine Disruptors 1995-1998
Border (US-Mexico) XXI - 1993-1997
EPA Administrator's NAFTA Taskforce 1993
Developmental Toxicity Risk Assessment Guidelines 1984-1992
Reproductive Toxicity Risk Assessment Guidelines 1985-1997
Workgroup on Developmental Neurotoxicology - Chairperson - 1986-1991

PUBLICATIONS (selected)

Lead Author for Multi-Year Plan for Safe Pesticides/Safe Products 2006
Lead Author for Multi-Year Plan for Endocrine Disruptors 2003
Contributor to Research Plan for Endocrine Disruptors 1998
R. Kavlock, G.T. Ankley, T. Collette, E. Francis, K. Hammerstrom, J. Fowle, H. Tilson, G. Toth, P.Schmieder, G. D. Veith, E. Wever, D. C. Wolf, D. Young. Computational Toxicology: Framework, Partnerships, And Program Development. September 29-30, 2003, Research Triangle Park, North Carolina. *Repro Toxicol.* 2005 Jan-Feb;19(3):265-80.
Elaine Z. Francis. Testing of Environmental Agents for Developmental and Reproductive Toxicity. In *Developmental Toxicology*. Second edition. Carole A. Kimmel and Judy Buelke-Sam, eds. Raven Press, New York. pp. 403-428. 1994.
Michael G. Narotsky, Elaine Z. Francis, Robert J. Kavlock. Developmental Toxicity and Structure-Activity Relationships of Aliphatic Acids, Including Dose-Response Assessment of Valproic Acid in Mice and Rats. *Fundam. Appl. Toxicol.*22:251-265. 1994.
E.Z. Francis. Regulatory Developmental Neurotoxicity and Human Risk Assessment. *Neurotoxicol* 13:77-84. 1992.
Carole A. Kimmel, Robert J. Kavlock, Elaine Z. Francis. Animal Models for Assessing Developmental Toxicity. In *Similarities and Differences Between Children and Adults: Implications for Risk Assessment*. ILSI Press, Washington, D.C. pp. 43-65. 1992.
Elaine Z. Francis, Carole A. Kimmel, D. Cooper Rees. Workshop on Qualitative and Quantitative Comparability of Human and Animal Developmental Neurotoxicity: Summary and Implications. *Neurotoxicology and Teratology* 12:285-292. 1990.
D. Cooper Rees, Elaine Z. Francis, Carole A. Kimmel. Scientific and Regulatory Issues Relevant to Assessing Risk for Developmental Neurotoxicity: An Overview. *Neurotoxicology and Teratology* 12:175-181. 1990.
D. Cooper Rees, Elaine Z. Francis, Carole A. Kimmel. Qualitative and Quantitative Comparability of Human and Animal Developmental Neurotoxicity: A Workshop Summary. *Neurotoxicology* 11:257-269. 1990.
Carole A. Kimmel, Gary L. Kimmel, Elaine Z. Francis, Laurence D. Chitlik. An Overview of the U.S. EPA Proposed Amendments to the Guidelines for the Health Assessment of Suspect Developmental Toxicants. *J. Amer. Coll. Toxicol.* 9(1):39-47. 1990.

BIOGRAPHICAL SKETCH

NAME: Robert J. Frederick, PhD POSITION TITLE: Senior Scientist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Union College, Schenectady, NY	B.S.	1962	Biology
U. Rhode Island, Kingston, RI	M.S.	1971	Bacteriology
Michigan State U., E. Lansing, MI	Ph.D.	1976	Molecular Biology

PROFESSIONAL EXPERIENCE

US Environmental Protection Agency; Office of Research and Development (ORD)
National Center for Environmental Assessment (NCEA), Washington Office
Senior Scientist 09/96 - present

Stockholm Environment Institute (SEI), Stockholm, SWEDEN
Biotechnology Advisory Commission (LEAVE OF ABSENCE FROM EPA)
Executive Secretary 10/93 - 9/96

US EPA, ORD, Office of Environmental Processes and Effects Research (OEPER)
Research Program Manager and Team Leader 12/88 - 9/93

USEPA, Office of Toxic Substances (OTS), Exposure Evaluation Division
Environmental Fate Section; Microbiologist and Section Chief 6/84 - 12/88

William Beaumont Army Medical Center (WBAMC), El Paso, TX
Supervisory Microbiologist and Chief, Microbiology Service 9/78 - 5/84

University of Texas, El Paso, TX
Adjunct Assistant Professor (Genetics) 9/79 - 5/84

Warner Lambert Pharmaceutical Co., Morristown, NJ
Assistant Scientist to Associate Scientist 3/69 - 12/72

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society for Risk Analysis
Editorial Board for *Genetically Modified Organisms: An International Journal* (2006 -)

SELECTED AWARDS AND HONORS

EPA Bronze Medal BORD Biotechnology Research Program Steering Committee, 2005.
EPA Bronze Medal B Inter Laboratory/Center/Office Study of Indoor Mold, 2003
Embassy Science Fellow B Vilnius, Lithuania (September/October, 2002)
Council for Excellence in Government Fellow (1992-93)
EPA Bronze Medal BBiotechnology Program Development, 1988
EPA Bronze Medal BBiotechnology Reviews, 1987

INVITED LECTURES/SYMPOSIA (10 of 25 in last 5 years; 55 total)

Agricultural Biotechnology and Environmental Monitoring in Developing Countries. Symposium for Agricultural Biotechnology Risk Analysis; Riverdale, Maryland. 11/30/05.

Environmental Risk Assessment of LMOs. Workshop organized by the National Institute for Health, Education, Science and Technology in Trinidad and Tobago as part of the UNEP/GEF program on Biosafety Development, October 10-14, 2005. Port of Spain, Trinidad.

From Gene Flow to the Ecology of Non-target Species: How EPA Research Supports the Regulation of Biotechnology. USGS Agricultural Practices Workshop. Denver, CO. 6/14,05.

Scientist to Scientist Roundtable discussions in Serbia-Montenegro. June 14-17, 2004. Invited by USDA Foreign Agricultural Service

Ecological Impacts from Biotechnology Plants: Using Risk Assessment Concepts to Develop Monitoring Strategies. Pennsylvania State University, University Park, 9//03.

Linking Strategic Monitoring to Biotechnology Risk Assessment of Plant Incorporated Protectants (PIPs), EPA Science Forum: Emerging Technologies Session, 5/8/03.

Ecological Impacts from Biotechnology Plants: Using Risk Assessment Concepts to Develop Monitoring Strategies. OPPT/OPP Seminar 9/3/03.

Post-Commercialization Monitoring of Biotechnology Crops. USDA/APHIS Panel Discussion, Riverdale, MD, 3/03
Biosafety Risk Assessment training programs in Lusaka, Zambia (May 27 to June 1, 2002). Invited by the Southern African Regional Biosafety (SARB) Program, an initiative of USAID

Biotechnology Regulation in the US. USDA Foreign Agricultural Service Team presentations in Montevideo, Uruguay; Asuncion, Paraguay; and Buenos Aires, Argentina (May 4 to 15, 2002)

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

(Selected activity since 1996)

Symposium for Agricultural Biotechnology Risk Assessment Research; 11/29/05-12/01/05—Steering Committee;

Program for Biosafety Systems--External Advisory Board Member 2003-2006

CAST Biotechnology Advisory Committee—Member 2003-2005

Strategic Monitoring for Ecological Impacts from Plant Incorporated Protectants: A Symposium. National Center for Environmental Assessment, Office of Research and Development, US EPA. Arlington, VA. 8/3-5/04--Organizer

A Framework for Biosafety Implementation: A Tool for Capacity Building. ISNAR Workshop, Washington DC; 7/24-26/ (see <http://www.essentialbiosafety.info>) —Steering Committee

Biosafety Training Workshop for African Regional Biosafety Focal Point (ARBFP) Representatives. Scientific and Industrial Research and Development Centre, Harare, Zimbabwe. 6/4-6/96—Organizer/Facilitator

Capacity Building in Biosafety for Developing Countries: Evaluation Criteria Development Workshop (Stockholm, Sweden). May 1996—Organizer

Grant Review Panels—EPA, USDA, and USAID programs; 6 since 1996.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY (Selected activity since 1996)

Plant Viral Coat Protein-FIFRA Exemption Work Group; 2004-present

EPA/ORD Biotechnology Risk Assessment Research Program—Steering Committee 2003-present

Consortium for Atlantic Regional Assessment (CARA—Advisory Council Member 2002-present

NCEA Colloquium on Current Use and Future Needs of Genomics in Ecological and Human Health Risk Assessment. 5/8/03 –Member Steering Committee

Understanding Experimental Use Permits (EUP)-- Workshop Steering Committee. 2003-2004

NIH Recombinant DNA Advisory Committee (RAC)--EPA representative (non-voting) 1990- present)

PUBLICATIONS (1998-2006)

Proceedings/Book Chapter/Workbook

McLean, M.A., R.J. Frederick, P.L. Traynor, J.I. Cohen, and J. Komen. (Eds.) 2003. *A Framework for Biosafety Implementation: Report of a Meeting.* The Hague, The Netherlands: International Service for National Agricultural Research.

Traynor, P., Frederick, R.J. and Koch, M. 2002. *Biosafety in Agricultural Biotechnology: A Workbook for Training in Biosafety Assessment.* Michigan State University, East Lansing, Michigan. (Now translated into Spanish, French and Portuguese).

Articles/Reports

Cohen, J.I., H. Quemeda and R.J. Frederick. 2003. *Food Safety and GM Crops: Implications for Developing Country Research.* An information brief for the International Food Policy Research Institute (IFPRI), Washington, DC. <http://www.ifpri.org/pubs/catalog.htm#focus>.

- Frederick, B. 2003. Prelude to Building a Framework for Implementing Biosafety. In : McLean, M.A., R.J. Frederick, P.L. Traynor, J.I. Cohen, and J. Komen. (Eds.). A Framework for Biosafety Implementation: Report of a Meeting. pp. 35-38. The Hague, The Netherlands: International Service for National Agricultural Research.
- McLean, M. A., Frederick, R.J., Traynor, P.L., Cohen, J.I. and Komen, J. 2002. A Conceptual Framework for Implementing Biosafety: Policy, Capacity and Regulation. 12p. Briefing Paper for International Service for National Agricultural Research (ISNAR), ISSN 1021-2310.
- Miller, J., Stahl, R.G., Courtenmanch, D.L., Frederick, R., Frissell, C., Kaplan, M., Sappington, K.G., and Zeeman, M.G. 1999. Management of Impacts of or Ecological Risks Posed by Multiple Stressors. In Multiple Stressors in Ecological Risk and Impact Assessment. J.A. Foran and S.A. Ferenc (eds.). Society of Environmental Toxicology and Chemistry (SETAC), Pensacola, Florida. 100p.
- Virgin, I., Frederick, R.J. and Ramachandran, S. 1999. Biosafety Training Programs and their Importance in Capacity Building and Technology Assessment. In: Shantharam, S. and J.F. Montgomery (eds). Biotechnology, Biosafety, and Biodiversity: Scientific and Ethical Issues for Sustainable Development. Science Publishers, Inc., Enfield, New Hampshire (USA), pp. 5-18.
- Frederick, R.J. 1998. Biosafety Regulatory Frameworks in Developing Countries. In: J. Richter, J. Huber and B. Schuler (eds). Biotechnology for Crop Protection-Its Potential for Developing Countries. Deutsche Stiftung für internationale Entwicklung (DSE), Zentralstelle für Ernährung und Landwirtschaft (ZEL), Feldafing, pp. 129-138.
- Frederick, R.J. 1998. International Biosafety Regulations: Benefits and Costs. In: C.L. Ives and B.M. Bedford (eds) Agricultural Biotechnology in International Development. CABI Publishing, New York, pp. 213-228.

NARRATIVE

My research interests focus on the fundamental need to better understand the significance of biotechnology adoption in agriculture with respect to changes in agrochemical use, the potential environmental impact of biotechnology products on non-target species, and the influence these should properly have in defining effective environmental monitoring programs. The aim of the research is to provide science based risk assessment tools and data support that ensure the comprehensive evaluation and long term safe use of genetically modified crops with plant incorporated protectants (PIPs).

BIOGRAPHICAL SKETCH

NAME: John P. Giesy

POSITION TITLE: Professor and Canada Research Chair in Environmental Toxicology, Department of Veterinary Biomedical Sciences and Toxicology Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Michigan State University	Ph.D.	1974	Environmental Toxicology

PROFESSIONAL EXPERIENCE

Note: Due to limitations in space, only main positions held during Prof. Giesy's career are listed.

Alma College: Instructor of Biology, 1972

Savannah River Ecology Laboratory: Assistant Research Ecologist: 1976-1980; Associate Research Ecologist: 1980-1981; Program Manager, Aquatic Ecology: 1979-1981

University of Georgia: Adj. Ass. Prof., Zoology: 1976-1980; Graduate Faculty: 1976-1980; Ecology Faculty: 1978-1980

University of South Carolina - Aiken Campus: Instructor of Biology: 1976

Emory University: Adj. Ass. Prof. of Biology: 1978-1981

University of Florida: Adj. Ass. Prof. of Environmental Engineering: 1978-1981

Michigan State University: Pesticide Research Center; 1981-1997; Prof. of Fisheries and Wildlife; 1985-1997; Adj. Ass. Prof. of Fisheries and Wildlife: 1980; Ass. Prof. of Fisheries and Wildlife: 1981-1985; Center for Environmental Toxicology: 1981-1991; Coordinator of Environmental Effects Research, College of Natural Science, Pesticide Research Center): 1981-1987; National Institutes of Environmental Health Safety Training Faculty: 1991-Present, and on the Faculty of the Toxicology Centre and Professor of Zoology Emeritus at Michigan State University

University of Bayreuth, Bayreuth Germany: Visiting Prof., Chair of Ecological Chemistry and Geochemistry: 1987-1988

Department of Biology and Chemistry, City University of Hong Kong, Hong Kong, SAR, China: Chair Prof. at Large: 2003-Present.

Nanjing University, Environmental Sciences Program, Nanjing, China: Concurrent Prof., 2003-Present

National Institute of Advanced Industrial Science and Technology (AIST)

Institute for Environmental Management Technology (EMTECH), Japan: Visiting Prof.: 2004-Present

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Note: Due to space limitations, only current appointments are listed.

American Association for the Advancement of Science: 1981-present

American Chemical Society (Environmental Chemistry Division): 1976-1980, 1989-Present

American Fisheries Society - Michigan Chapter: 1984-Present

American Institute of Biological Sciences: 1978-Present

American Institute of Fisheries Research Biologist: 1982-Present

American Society of Limnology and Oceanography: 1970-Present

American Society for Testing Materials (Section E.47): 1975-Present

Ecological Society of America: 1970-Present

Great Lakes United: 1985-Present

International Association of Geochemistry and Cosmochemistry: 1976-Present
International Association for Great Lakes Research: 1982-Present
International Association for Sediment Water Science: 1990-Present
International Association on Water Quality: 1990-Present
International Water Association: 1999-Present
International Society for the Study of Xenobiotics: 1981-Present
International Society for Ecotoxicology and Environmental Safety: 1985-Present
International Society of Theoretical and Applied Limnology: 1972-Present
International Statistical Ecology Program: 1982-Present
International Water Association: 1999-Present
Michigan Academy of Science Arts and Letters: 1969-1974; 1987-Present
Midwest Pollution Control Biologists: 1988-Present
Society for Environmental Geochemistry and Health: 1979-Present
Society of Environmental Toxicology and Chemistry (SETAC): 1979-Present
Society of Toxicology; Michigan Regional Chapter: 1984-Present.
Water Pollution Control Federation: 1970-Present.

SELECTED AWARDS AND HONORS

Note: Prof. Giesy has received over 40 awards or honors, due to space limitations only a select few are listed here.
International Man of the Year in Environmental Toxicology - International Biographical Centre, Cambridge, England: 1992-1993 and 2000-2001

Best Ecological Risk Assessment Paper published during 2001 in Human and Ecological Risk Assessment: Human Ecol Risk Assess. (2001)7:497-632.

InCites Highly Cited Author Recognition- Since 2001 Dr. Giesy has been one of the top 10 highly cited active authors in such area's as Polychlorinated Biphenyls in the environment, and the Fields of Ecology and Environment.

The following paper was selected by the Journal Toxicological Sciences to be highlighted and a special review article written: Tox. Sci. (2002) 68:429-436.

SETAC Environmental Education Award: 2002

Who's Who Award for Achievement: 2002

21st Century Award for Achievement: 2002

INVITED LECTURES/SYMPOSIA

Note: Due to limitations in space, only a selection of 5 invited presentations is listed below.

“Principles for Assessing Effects on the Endocrine System: Field and Laboratory Research”. To: A Scientific Panel Discussion on Endocrine Disruptors in the Environment, March 16-19, 1996, Kiawah Island, SC. **Invited Keynote Speaker.**

SETAC-Europe/OECD/EC Expert Workshop on Endocrine Modulators and Wildlife: Assessing and Testing (EMWAT) Veldhoven, The Netherlands, April 10-13, 1997. **Invited Delegate**

“Endocrine Disruptor Mechanisms: Beyond Receptor Binding”. With A.L. Blankenship, J.T. Sanderson, M. van den Berg and M. Nie. Society of Environmental Toxicology and Chemistry (SETAC), 22th Annual Meeting, November 11-15, 2001, Baltimore, Maryland. **Invited**

“SOT/SETAC Mixtures Workshop”. September 21 and 22, Washington, DC. **Invited Delegate.**

“Endocrine Disruptor Mechanisms: Beyond Receptor Binding”. SETAC-Europe, United Kingdom Division, Annual meeting, September 8-10, 2003, Aberdeen, Scotland. **Invited Plenary Keynote.**

“Early Exposure-Late Effects in Invertebrates and Vertebrates. Society of Environmental Toxicology and Chemistry (SETAC), 16th Annual meeting, May 7-11, 2006, The Hague, The Netherlands. **Invited, Plenary Keynote Address.**

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Note: Due to limited space, only a select few of services provided to the scientific community are listed.

National Academy of Science, National Institutes of Medicine and Natural Research Council Panels:

Committee on Assessment of Risks from Remediation of PCB-Contaminated Sediments: 1999-2001

Committee on Bioavailability of Pollutants from Soils and Sediments: 2000-2002

Committee on Strengthening Science-based Decision-making on Persistent Organic Pollutants in China: 2003-2004.

National Institutes of Health Advisorships:

National Toxicology Program (NTP) Board of Scientific Councilors (BOSC), National Institutes of Environmental Health Sciences (NIEHS), of the National Institutes of Health (NIH): 2003-2006

NTP, NIEHS Technical Subcommittee, 2003-2006.

World Health Organization Advisorships:

Development of Toxic Equivalency Factors of polychlorinated dibenzo dioxins (PCDDs, polychlorinated dibenzofurans (PCDFs) and polychlorinated biphenyls (PCBs) for fish, birds and mammals: 1996-1999

Global Assessment of the State-of-the-Science of Endocrine Disruptors. United Nations Environment WHO Program and International Programme on Chemical Safety: 1998-2000.

United Nations Advisorships: Scientific Technical and Advisory Panel Roster of Experts (Persistent Organic Pollutants). 2003

International Advisorships:

Scientific Advisory Panel of the Environment Agency, United Kingdom. 2004-2007.

Network on Environmental Risk Assessment and Management, Australian Research Council, 2004-2007.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Board of Scientific Counselors (BOSC) Executive Committee: 2004-2006

Nomination Committee, 2005

Committee on Risk Assessment Workshop, US EPA/US NAS, 2004-2005List

In addition, Dr. Giesy has participated in the writing of numerous documents and guidelines for the US-EPA.

PUBLICATIONS - represent 10 out of a total of 451 manuscripts:

Giesy, J.P., L. A. Feyk, P. D. Jones and K. Kannan. 2003. Review of the Effects of "Endocrine Disrupting Chemicals in Birds. *Pure Appl. Chem.* 75:2287-2303.

Villalobos, S.A., D.M. Papoulias, S.D. Pastva, A.L. Blankenship, J. Meadows, D.E. Tillitt and J.P. Giesy. 2003. Toxicity of *o,p'*-DDE to Medaka Embryos after Nano-injection Exposure. *Chemosphere* 53:819-826.

Hilscherova, K., J.P. Giesy, P.D. Jones, J.L. Newsted, T. Gracia, X. Zhang, R. Yu and R. Wu. 2004. Assessing Effects of Chemicals on Steroidogenic Enzymes by RT-Q-PCR in the H295R Cell Line. *Toxic. Sci.* 81:78-89.

Hecker, M., J-W. Park, M. B. Murphy, P. D. Jones, K. R. Solomon, G. Van Der Kraak, J. A. Carr, E. E. Smith, L. Du Preez, R. J. Kendall and John P. Giesy. 2005. Effects of Atrazine on CYP19 Gene Expression and Aromatase Activity in Testes and on Sex Steroid Concentrations in Plasma of Male African Clawed Frogs (*Xenopus Laevis*). *Tox. Sci.* 86:273-280.

Hu, W., P. D. Jones, T. Celiuș and J. P. Giesy. 2005. Identification of Genes Responsive to PFOS Using Gene Expression Profiling. *Env. Toxicol. Pharmacol.* 19:50-57.

Zhang, X., R. Yu, P. D. Jones, J. L. Newsted, T. Gracia, M. Hecker, K. Hilscherova, J. T. Sanderson, R. Wu, and J. P. Giesy. 2005. Quantitative RT-PCR Methods for Evaluating Toxicant-Induced Effects on Steroidogenesis Using the H295R Cell Line. *Environ. Sci. Technol.* 39:2777-2785

Blaha, L., K. Hilscherova, E. Mazurova, M. Hecker, P. D. Jones, P. Bradley, T. Gracia, Z. Duris, I. Holoubek, J. P. Giesy. 2006. Alteration of steroidogenesis in H295R cells by organic sediment contaminants and relationships to other endocrine disrupting effects. *Environ. Internat.* 32:749-757.

Villeneuve, D. L., M. B. Murphy, M. D. Kahl, K. M. Jensen, B. C. Butterworth, E. A. Makynen, E. J. Durhan, A. Linnum, R. L. Leino, L. R. Curtis J. P. Giesy, G. T. Ankley. 2006. Evaluation of the Methoxytriazine Herbicide Prometon in a Short-term Fathead Minnow Reproduction Test and a Suite of In Vitro Bioassays. *Envir. Toxicol. Chem.* 25:2143-2153.

- Gracia, T., K. Hilscherova, P. D. Jones, J. L. Newsted, X. Zhang, T. S. Sanderson, R. Yu, R. Wu and J. P. Giesy. 2005. Assessment of the Effects of Chemical Mixtures on the Expression of Ten Steroidogenic Genes in the H295R Cell Line. *Ecotox. Environ. Safety*. (In Press).
- Hecker, M, J. L. Newsted, M. B. Murphy, E. B. Higley, P. D. Jones, R. Wu and J. P. Giesy. 2006. Human Adrenocarcinoma (H295r) Cell System For Rapid Testing Of Chemical Effects On Steroidogenesis. *Toxicol. Appl. Pharmacol.* (In Press).

BIOGRAPHICAL SKETCH

NAME: John A. Glaser

POSITION TITLE: Physical Scientist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Wheeling Jesuit University	B.S.	1966	Chemistry
University of Georgia	Ph.D.	1979	Organic Chemistry

PROFESSIONAL EXPERIENCE

Leader of Biotechnology and Sustainable Technology Team, Lead Scientist for National Risk Management Research Laboratory, Sustainable Technology Division, Sustainable Environments Branch, NRMRL Biotechnology Research Program; 3/99-present

Team Leader for Soil Bioremediation, Physical Scientist: U.S. EPA. ORD, National Risk Management Research Laboratory, Land Remediation Pollution and Control Division, 10/95- 3/99.

Team Leader for Soil Bioremediation, Physical Scientist: U.S. EPA, ORD, Risk Reduction Environmental Laboratory, Water and Hazardous Waste Research Division; 1/90-9/95

Physical Scientist/Chemist: U.S. EPA, ORD, Hazardous Waste Environmental Research Laboratory, Hazardous Waste Research Division; 1/85-7/90

Chemist: U.S. EPA, ORD, Hazardous Waste Environmental Research Laboratory, Office of Program Operations, Analytical Services Group; 1/83-1/85.

Chemist US EPA, ORD, Industrial Environmental Research Laboratory, Forest and Wood Products Branch; 10/80-1/83

Chemist US EPA, ORD, Environmental Monitoring and Support Laboratory, Chemical & Physical Methods Branch, Organic Methods Section, 6/79-9/80

1989 to Present, Adjunct Professorship - University of Cincinnati, Department of Civil and Environmental Engineering, Cincinnati, OH 45220

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Chemical Society
Sigma Xi
Phi Kappa Phi
News Editor for Clean Technology and Environmental Policy
News Editor for Clean Products and Processes
Editorial Board Soil & Sediment Contamination
Editorial Board for International Journal of Phytoremediation
Reviewer for Environmental Science & Technology, Journal of Environmental Quality, Agriculture Ecosystems and Environment, Biologica, Biotechnology Bioengineering, Chemical Processes, Clean Products and Processes, Environmental Entomology, Journal of Environmental Management & Water Research

SELECTED AWARDS AND HONORS

UDSA/USEPA Award for Fungal Treatment Process Development
Gold Medal, USEPA 1989 Alaskan Oil Spill Project
Bronze Medal, USEPA 1998 Superior performance as a member of EPA's Biosystems Committee
Bronze Medal, USEPA 2006 Development of USEPA Biotechnology Research Program
U.S. Environmental Protection Agency - Scientific and Technology Award 1982

INVITED LECTURES/SYMPOSIA

- 2006 NORTH CENTRAL BRANCH, Entomological Society of America, 61st Annual Meeting
Bloomington, IL, **Sustainability, Data Quality and Bt Crop Stewardship Management**
- 2006 Entomological Society of America National Meeting, Indianapolis, IN, *Assessment of the foliar pigments chlorophyll, anthocyanin and carotenoid for insect infested Bt and non-Bt corn*
- 2006 Entomological Society of America National Meeting, Indianapolis, IN, *Development of a remote sensing program to monitor for resistance development in transgenic crops*
- 2006 Ohio Water Environment Association, Cincinnati, OH, *The Role of Remote Sensing for Transgenic Crops Monitoring*
- 2006 NRMRL Seminar Series, Cincinnati, OH, **“The Role of Remote Sensing for Transgenic Crops Monitoring: A Perspective on IPM Applications for Remote Sensing”**
- 2006 5th Annual NY State Remote Sensing Symposium, Remote Sensing Across the Great Lakes: Observation, Monitoring and Action, Rochester, NY, **“Pesticidal Transgenic Crop Monitoring: A Role for Spectral Imaging?”**
- 2006 Third Workshop on Susceptibility of Field Collected Lepidoptera to Bacillus thuringiensis Proteins in North America, Monterrey Mexico, **“The Role of Remote Sensing for Transgenic Crop Monitoring”**
- 2006 Monitoring and Managing Bt-Resistance: The Challenges for the Next Decade, Society for Invertebrate Pathology Meeting, Wuhan China, **“Resistance Monitoring for Bt crops: A US EPA Perspective”**, SR Matten, and JA Glaser
- 2006 EPA GIS and Statistics Meeting, Cincinnati, OH, *Use of GIS to Manage Pest Resistance Development To Pesticidal Transgenic Crops*, JA Glaser and M Carroll
- 2006 Brazilian Entomological Congress, Recife, Brazil, **“Possible Role of Remote Sensing for Transgenic Crop Monitoring”**, T Hunt, JA Glaser, R Hellmich,

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

PATENTS

US Patent 5476788 Solid phase bioremediation methods using lignin-degrading fungi

US Patent Pending Optical System for Plant Characterization

Organizer/Leader

2006 ESA National Meeting, Indianapolis, IN, **Entomological Society of America Symposium, Bt Crop Sustainability**

2006 Entomological Society of America, 61st North Central Branch Annual Meeting, Bloomington, IL, **Advances in Bt Crop Stewardship Management**

2006 USEPA Workshop, Arlington VA, EPA Workshop Series on Bt Crop Management and Environmental Effects: **Non-Target Effects Compendium Review Workshop**

2004 Monitoring Science & Technology Symposium, Denver, CO, **“Spectral Imaging Remote Sensing and Beyond”**

2004 USEPA Workshop, Cincinnati, OH, *Resistance Management Modeling Workshop*

2003 USEPA Science Forum, Washington DC,

2002 USEPA Workshop, Arlington VA, EPA Workshop Series on Bt Crop Management and Environmental Effects: *Ecological Assessment of Bt Crops on Non-Target Invertebrates*

2002 Sixth Symposium on Environmental Biotechnology, Veracruz, Mexico, Sessions on **Development of Cleaner Bioprocesses, and Sustainable Management of Water and Other Natural Resources**

Advisor

Member of USEPA FIFRA Viral Coat Protein Workgroup 2004-present

Member of Workgroup Evaluating Regulations to Facilitate Compliance with the Federal Insecticide, Fungicide, and Rodenticide Act by Producers of Plant-Incorporated Protectants 2006-

Member of SP2 Biotechnology Research Advisory Committee 2002-present

Technical Expert to US EPA Office of Research and Development Scientific Advisory Board 2004

Member of Federal Scientific Advisory Board to Contaminated Soils, Sediments and Water International Conference, Sponsored by Association for the Environmental Health & Sciences 1998- present

Member of Advisory Committee for Hydrocarbon National Test Site at Pt Hueneme Naval Base 1994-2003

Scientific Steering Committee for EPA Biosystems Technology Development Program 1987-present
Expert Dissertation Examiner, Candidate: Monika Walter “*Towards Optimization of Whit-rot Fungi Bioremediation*” University of Christchurch, Christchurch, New Zealand 2004

Thesis Committee, University of Cincinnati, Candidate: Susan Strohofer, Department of Civil and Environmental Engineering.

Dissertation Committee, University of Cincinnati, Candidate: Salvatore Giolando, Department of Environmental Health “The Fate of Azo Dyes in Aerobic Microbial Degradation Systems: C.I. Acid Orange 7

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Lead Scientist for the NRMRL Biotechnology Research Program and Team Leader for the Sustainable Technology Team of the Sustainable Environments Branch. Current work focuses on the evaluation of technology and products to meet the criteria of sustainability. Designed scheme of workshops and other information gathering means to assist the development of analytical framework for the resistance management of transgenic crops. The NRMRL Biotechnology Program evaluates remote sensing for crop monitoring, resistance model testing and development, resistance detection methodology standardization, development of non target effects field scale protocols, pollen effects management, and toxin testing standardization. Lead investigation of other applications of sustainability assessment with electronic waste and biobased production schemes that convert biomass into desirable chemicals and other products.

PUBLICATIONS

Glaser, J.A., Copenhaver, K., Hellmich, R., Calvin, D., Hunt, T., Russo, J. (2007). “The Use of Spectral Imagery to Distinguish Transgenic Corn(Maize) Varieties from their Nearest Relative Isolines”, Draft, Targeted Journal: Nature.

Glaser, J.A., Copenhaver, K., Hellmich R., Calvin, D., Hunt T., Russo, J (2007). “Identification of Stemborer Infestation in Corn Varieties by Spectral Imaging”, Draft, Targeted Journal: Science.

Carroll, M.W., **Glaser, J.A.**, Hellmich, R.L., Sappington, T., Copenhaver, K., Fridgen, J. (2007) Detection of European Corn Borer, *Ostrinia nubilalis* (Hübner), Infestation in Iowa Corn Plots using Spectral Vegetation Indices for the Foliar Plant Pigments, Chlorophyll, Anthocyanin and Carotenoid. J. Econ Entomol (Submitted)

Carroll, M., **Glaser, JA**, Copenhaver, K., Hellmich, R. (2007). “Evaluation of a remote sensing method for detecting differing levels of European corn borer, *Ostrinia nubilalis* (Hübner), infestations in *Zea mays* L. using the foliar pigments chlorophyll, carotenoid and anthocyanin”, (draft), Targeted Journal: Environ Entomol

Carroll, M., Glaser, JA, Copenhaver, K, Hellmich, R, Sappington, T. (2007). “Use of spectral vegetation indices for detection of artificially inoculated European corn borer, *Ostrinia nubilalis* (Hübner), infestations in *Zea mays* L.”, Targeted Journal: J Econ Entomol

Carroll, M., Glaser, JA, Copenhaver, K (2007). General linear mixed model approach for analysis of airborne hyperspectral imagery of *Zea mays* L. manually infested with European corn borer, *Ostrinia nubilalis* (Hübner)”, Targeted Journal: Remote Sensing Ag Environ

Carroll, M, Glaser, JA, Hunt, T, Copenhaver, K. “Influence of water availability on the foliar pigments chlorophyll, carotenoid and anthocyanin in *Zea mays* L. inoculated with neonate European corn borer, *Ostrinia nubilalis* (Hübner), larvae.” Targeted Journal :Environ Entomol

Carroll, M, Glaser, JA, Copenhaver, K, (2007). “Spatial analysis of spectral vegetation indices and remote measures of leaf pigment concentration for identification of insect induced plant stress in plantings of *Zea mays* L.”, Targeted Journal: Remote Sensing Environ

Sumerford, D.V., Robbins, J.C., Kronback, K.T., **Glaser, J.A.**, Hellmich, R.L., Lewis, L.C. (2006). “Inbreeding depression in families of *Ostrinia nubilalis* (Lepidoptera: Crambidae): Effects on laboratory bioassays” J. Econ Entomol. (Submitted)

Sumerford, D.V., J.C. Robbins, K. Kronback, **J.A. Glaser**, L.C. Lewis, (2006). “Lifestyles of *Ostrinia nubilalis* (Lepidoptera: Crambidae) in mating arenas: mating, egg production, and death” J Insect Science (in Press)

Glaser, J.A., Matten S.R. (2003). Sustainability of insect resistance management strategies for transgenic Bt corn.

Biotechnol Adv **22**(1-2), 45-69.
Sasek, V., Glaser, J. A., Baveye, P. (eds) (2003): The utilization of bioremediation to reduce soil contamination: problems and solutions NATO science series IV: Earth and Environmental Sciences 19 Kluwer Academic Publishers, Dordrecht, S. 221-226

BIOGRAPHICAL SKETCH

NAME: Timothy R. Gleason

POSITION TITLE: Branch Chief/Supervisory
Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Bates College	B.S.	1983	Biology
University of Rhode Island	M.S.	1988	Fisheries
University of Rhode Island	Ph.D.	1995	Biology

PROFESSIONAL EXPERIENCE

- 2000-Present Branch Chief/Supervisory Research Biologist, Atlantic Ecology Division, National Health and Environmental Effect Research Laboratory, U.S. EPA, Narragansett, RI
- 2001-2002 Assistant Laboratory Director (acting), National Health and Environmental Effect Research Laboratory, U.S. EPA, Research Triangle Park, North Carolina (7 month temporary assignment) – ALD for Toxics and Pesticides.
- 1995-2000 Research Biologist, Atlantic Ecology Division, National Health and Environmental Effect Research Laboratory, U.S. EPA, Narragansett, RI
- 1993 - 1995. Biologist/ Work Assignment Manager, Science Applications International Corporation, Narragansett, RI
- 2001-Present Adjunct Assistant Professor, Department of Fisheries, Animal and Veterinary Sciences. University of Rhode Island, Kingston, RI

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society for Ecological Restoration, Board of the New England Chapter or the Society for Ecological Restoration, Society of Conservation Biology, Estuarine Research Federation. Sally Richardson Award Committee, American Fisheries Society, Early Life History Division (2000 – 2002).

SELECTED AWARDS AND HONORS

National Health and Environmental Effect Research Laboratory, Teamwork Award 2005.
USEPA Science and Technology Achievement Award, Level II 2003, Level III 2001, Honorable Mention 2002, 2003, 2004 (n=2).
Bronze Medal - USEPA, OW, Innovation in Water Quality Criteria for the Protection of Aquatic Life 2002.

INVITED LECTURES/SYMPOSIA

Invited speaker: ORD/OPPTS Seminar Series, Washington, DC. 2005.
Invited speaker: Society of Environmental Toxicology and Chemistry, Portland, OR 2004.
Invited speaker: Indicators in Health and Ecological Risk Assessment, NHEERL Symposium, Raleigh, NC 2000.
Invited speaker: Challenges in Applied Population Biology, Association of Applied Biologists, London, UK 1999.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Steering Committee for the New England Chapter of the Society for Ecological Restoration, 2006.
Invited panelist at the Society of Toxicology, Probabilistic Risk Assessment, Washington, DC 2005.
Chaired: Advances in Ecological and Human Health Risk Assessment, Boston, MA 2004.
Sally Richardson Award Committee, American Fisheries Society, Early Life History Division (2000 – 2002).
Mentor – NRC post doctoral program 1999.

Mentor – undergraduate students, NNMES Program, Rhode Island State Internship Program 1996-1999.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Steering Committee for evaluation of the application of Tiered Aquatic Life Uses to estuarine environment - Casco Bay/NEP/Estuarine TALU 2006.

Steering Committee Co-chair - NHEERL Safe Pesticides/Safe Products (SP2) Multi-Year Implementation Planning Committee, 2003 – 2005.

Co-author NHEERL Wildlife Research Strategy 2005.

Established the ORD/OPPTS Seminar Series 2001.

NHEERL Wildlife Risk Assessment Workgroup 1999 – Present.

Invited Speaker - Joint meeting between OPPTS and ORD, October 1999.

Invited to OW and ORD research planning meeting 1999.

Co-author Dissolved Oxygen Document 1999.

SELECTED PUBLICATIONS

Nacci, D., Walters, S., Gleason, T., and Munns, W.R., Jr. 2006. Using a spatial modeling approach to explore ecological factors relevant to the persistence of estuarine fish (*Fundulus heterclitus*) in a PCB-contaminated estuary In: Population-level Ecotoxicology, Editor: R. Akcakaya. (accepted).

Gleason, T., W.R. Munns Jr., S. Bradbury, T. Henry, J. Nichols, A. Trebitz, J. Baker, S. Heppell and N. Schumaker. 2005. Wildlife Research Strategy. Research Triangle Park, NC: USEPA. EPA 600/R-04/050, Contribution No. AED-04-056.

Nacci, D., T. Gleason, and W.R. Munns, Jr. 2002. Evolutionary and ecological effects of multi-generational exposures to anthropogenic stressors. *Human and Ecological Risk Assessment* 8(1): 91-97.

Gleason, T.R., and D.E. Nacci. 2001. Risks of endocrine-disrupting compounds to wildlife: extrapolating from effects on individuals to population response. *Human and Ecological Risk Assessment* 7(5):1027-1042.

Nacci, D., T.R. Gleason, R. Gutjahr-Gobell, M. Huber, and W.R. Munns, Jr. 2001. Effects of environmental stressors on wildlife populations: In *Coastal and Estuarine Risk Assessment: Risk on the Edge*. Editor: M.C. Newman. CRC Press/Lewis Publishers, Washington, DC.

Pechenik, J.A., T.R. Gleason, D. Daniels, and D. Champlin. 2001. Influence of larval exposure to salinity and cadmium stress on juvenile performance of two marine invertebrates (*Capitella* sp. I and *Crepidula fornicata*). *Journal of Experimental Marine Biology and Ecology* 264 (2001):101-114.

Gleason, T.R., Munns, W.R., Jr. and D.E. Nacci. 2000. Projecting population-level response of purple sea urchins to lead contamination for an estuarine ecological risk assessment. *Journal of Aquatic Ecosystem Stress and Recovery* 7(3):177-185.

Gleason, T.R., W.R. Munns, Jr. and D.E. Nacci. 1999. Influence of model time step on the relative sensitivity of population growth rate to survival, growth and reproduction. In: *Challenges in Applied Population Biology*, July 8-9, 1999 Royal Holloway, University of London, produced by the Association of Applied Biologists, M.B. Thomas and T. Kedwards, eds. *Aspects in Applied Biology* 53:253-260.

Nacci, D., L. Coiro, D. Champlin, S. Jayaraman, R. McKinney, T. Gleason, W.R. Munns, Jr., J. Specker and K. Cooper. 1999. Adaptation of wild fish populations to dioxin-like environmental contamination. *Marine Biology* 134: 9-17.

Thursby, G., D.C. Miller, S. Poucher, L. Coiro, W.R. Munns, Jr., T.R. Gleason. 1999. Protection of Coastal and Estuarine Waters from Low Dissolved Oxygen: Cape Cod to Cape Hatteras. Ross Elliot, Project Officer, U.S. EPA OW, OST, 401 M. Street WX, Washington, DC 20460. 88 pages.

NARRATIVE

Tim is a biologist with expertise in developing and applying quantitative methods to support ecological risk assessment, including development and application of population models to estimate risks of anthropogenic chemicals. His current research is focused on how habitat alterations influence population response.

BIOGRAPHICAL SKETCH

NAME: Jason Grear

POSITION TITLE: Research Ecologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Connecticut College	B.A.	1986	Zoology
University of Florida – Gainesville	M.S.	1992	Wildlife Ecology
Yale University	Ph.D.	2003	Behavioral and Spatial Population Ecology

PROFESSIONAL EXPERIENCE

Research Ecologist, June 2005 – present. Population Ecology Branch, Atlantic Ecology Division, NHEERL / ORD, Narragansett, RI

Postdoctoral Ecologist, August 2003 – June 2005. Population Ecology Branch, Atlantic Ecology Division, NHEERL / ORD, Narragansett, RI

Visiting Lecturer, January 2004 – May 2004. Yale University School of Forestry and Environmental Studies. New Haven, CT (Taught core course in ecology).

Doctoral Fellow, September 1998 – May 2002. Yale University School of Forestry and Environmental Studies. New Haven, CT.

Teaching Fellow, September 2002 – May 2003. Yale University Graduate School, New Haven, CT.

Senior Biologist, November 1992 – March 1998. Office of Long Island Sound Programs, Connecticut Department of Environmental Protection. Hartford, CT.

Research Assistant (US FWS) and M.S. Candidate, September 1989 – May 1992. University of Florida, Gainesville, FL.

Research Assistant, January 1988 – August 1999. Manomet Center for Conservation Sciences. Manomet, MA.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Ecological Society of America (past member); Society for Conservation Biology (past member)

SELECTED AWARDS AND HONORS

G. Evelyn Hutchinson Fellowship, 1999-2000

Sigma Xi Grant-in-Aid of Research, 2001

Sperry Foundation Grants, 2000, 2002

Mellon Foundation Grants, 2000, 2002

Merit-based scholarship (with full tuition and stipend support), Yale University, 1998-2002.

Distinguished Service Award: Connecticut Environmental Review Team, 1997

INVITED LECTURES/SYMPOSIA

Invited presenter. SETAC 2006 Session: Wildlife Population Risks from Mercury Exposure, Montreal, Quebec.

Invited seminar. Connecticut College, March 2004. Spatial distribution in a forest floor insect depends on seasonal grouping behavior and scattering effects of predators.

Invited seminar. University of Chicago, Department of Statistics and Center for Integrating Statistics and Environmental Science, January 2004. Mechanisms driving spatial aggregation in a forest insect.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Reviewer for Biotropica, Biological Invasions, Ecology, Ecology and Society, Ecotoxicology, Estuaries, Integrated Environmental Assessment and Management, National Science Foundation, Oecologia, Wetlands Ecology and Management, The Nature Conservancy, CT Sea Grant Statewide Proposal Review Panel, Long Island Sound Research Fund, Long Island Sound License Plate Program

Board member: Tolland Conservation Commission, Tolland, CT, 2001-2003

Board member: Connecticut Audubon Coastal Center Scientific Advisory Board, 1996-1998

Board member: Connecticut Natural Area Preserve Advisory Group, 1996-1998

Chair, Annual Long Island Sound Research Symposium, 1994-1998

Mentor for Coastal Management Fellow through NOAA's Coastal Management Fellows Program and CT Department of Environmental Protection's Office of Long Island Sound Programs

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Coauthor of population ecology and modeling sections in: Draft Implementation Plan for Safe Pesticides/Safe Products Research, National Health and Environmental Effects Research Laboratory, Office of Research and Development, August, 2005

Nacci, D, J. Gear, and A. Kuhn. 2005. Overview of U.S. Environmental Protection Agency National Health and Environmental Effects Research Laboratory research products to support Annual Performance Goal 30. Report to U.S. EPA Office of Water.

Gear, J., D. Nacci, A. Kuhn, S. Walters, and J. Copeland. 2005. Methods for developing water quality criteria based on population-level risks of multiple stressors to aquatic life and aquatic-dependent wildlife: Population modeling and analysis. Report to U.S. EPA Office of Water (APM 567).

Kuhn, A., J. Copeland, J. Gear, S. Walters, M. Nicholson, and D. Nacci. 2005. Report on habitat suitability indices to support population models for projecting relative risk of multiple stressors including toxic chemicals and habitat alteration to common loons. Report to U.S. EPA Office of Water (APM 558).

Gear, J., G. Thursby, S. Ayvazian, and T. Gleason. In review. Construction and application of a stochastic population model for integrating mysid demographic and toxicological sensitivities into wildlife risk assessment. APM 180. Report to Office of Prevention, Pesticides and Toxic Substances (OPPTS).

Thursby, G., T. Gleason and J. Gear. Classifying life histories for screening-level assessments. Presentation to the Office of Pesticide Programs (APM 367). November 3, 2005.

Gear, J. Comparing simple and complex population models through a cooperative agreement by the US EPA and the University of Chicago. Poster presentation at the EPA Science Forum, May 2005.

Gear, J. Population modeling to Support Ecological Risk Assessment: An Example using Mysid Toxicity Test Data. Presentation to Office of Water. September 16, 2004. Washington, D.C.

Gear, J. Population modeling to Support Ecological Risk Assessment: An Example using Mysid Toxicity Test Data. Presentation to Office of Pesticides. September 16, 2004. Washington, D.C.

PUBLICATIONS

Gear, J.S. and C.E. Burns. In Press. The importance of low quality habitats for regional population growth in *Peromyscus leucopus*: Insights from field-parameterized spatial matrix models. Landscape Ecology.

Nacci, D, M. Pelletier, J. Lake, R. Bennett, J. Nichols, R. Haebler, J. Gear, A. Kuhn, J. Copeland, M. Nicholson, S. Walters, and W. Munns, Jr. 2005. Predicting wildlife population effects from mercury and other stressors. Ecotoxicology 14: 283-293

Gear, J.S. and O.J. Schmitz. 2005. Effects of grouping behavior and predators on the spatial distribution of a forest floor arthropod. Ecology 86: 960-971

Brokaw, N., S. Fraver, J.S. Gear, J. Thompson, J.K. Zimmerman, E.M. Everham III, R. Waide, S.P. Hubbell and R. B. Foster. 2004. Disturbance and canopy structure in two tropical forests. In E. Losos and E. Leigh (eds.).

- Forest Diversity and Dynamism. University of Chicago Press.
- Gear, J.S. and J.A. Collazo. 1999. Habitat use by migrant shorebirds in a tropical salt flat system. *Journal of Neotropical Wildlife (Vida Silvestre Neotropical)* 7: 15-22.
- Brokaw, N., J.S. Gear, K.J. Tripplet, A. Whitman, and E.P. Mallory. 1997. The Quebrada de Oro forest of Belize: Exceptional structure and high species richness. *Tropical Ecology* 38: 247-258.

BIOGRAPHICAL SKETCH

NAME: Zhishi Guo

POSITION TITLE: Environmental Scientist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Inner Mongolia University, China	B.S.	1965	Chemistry
University of North Carolina at Chapel Hill	Ph.D.	1987	Environmental Sciences & Engineering

PROFESSIONAL EXPERIENCE

1997-present: Environmental Scientist, EPA/ORD/NRMRL Indoor Environment Management Branch, Research Triangle Park, NC; Graduate School Faculty at the University of North Carolina at Chapel Hill (2003-2006)

1988-97 Staff Scientist (1988)/Senior Scientist (1991), Acurex Environmental Corp, Research Triangle Park, NC

1985-88 Research Associate, Department of Environmental Sciences & Engineering, University of North Carolina at Chapel Hill, NC

1983-85 Visiting Scientist, Department of Environmental Sciences & Engineering, University of North Carolina at Chapel Hill, NC

1975-1983 Research Engineer, Baotou Institute of Environmental Protection, Baotou, Inner Mongolia, China.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Chemical Society

American Society of Testing and Materials

Air and Waste Management Association

SELECTED AWARDS AND HONORS

2006 EPA Bronze Award for exemplary efforts to reduce serious hazards and potential risks associated with PFOA/PFOS chemicals

2004 OPPT Mission Award for PFOA Workgroup

INVITED LECTURES/SYMPOSIA

Invited lecture on indoor environmental quality research at Peking University, Beijing, China (2004, 2005)

Invited lecture on indoor air chemistry at Shandong University, Jinan, China (2005).

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Member of the International Science Committee and Session Chair for the 10th International Conference on Indoor Air Quality and Climate (2005).

Served as an International Expert for the United Nations Development Programme (UNDP) for an indoor air quality study in Guiyang, China

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

EPA Perchloroethylene dry clean residual risk workgroup (2003-present)

EPA/OPPT PFOA workgroup (2003-present)

EPA multi-year planning workgroup for Goal 8.2 Human Health (2002-2004)

PUBLICATIONS

(Publications represent 12 out of a total of 22 for the period 1998-2006)

Guo, Z. (2005), *Potential Inhalation Exposure to Volatile Chemicals in Water-based Hard-surface Cleaners*, National Risk Management Research Laboratory, Research Triangle Park, NC, Report No. EPA-600/R-05-005, 52 pp

Guo, Z. (2005), *Program PARAMS User's Guide*, National Risk Management Research Laboratory, Research Triangle Park, NC, Report No. EPA-600/R-05/066, 32 pp.

Guo, Z. and Roache, N. F. (2003), "Overall mass transfer coefficient for pollutant emissions from small water pools under simulated indoor environmental conditions," *Annals of Occupational Hygiene* (in press).

Guo, Z. (2002), "Review of indoor emission source models – part 1. overview," *Environmental Pollution*, Vol. 120, pp 533-549.

Guo, Z. (2002), "Review of indoor emission source models – part 2. parameter estimation," *Environmental Pollution*, Vol. 120, pp 551-564.

Guo, Z., Mosley, R., Wasson, S., Fortmann, R., and McBrien, J. (2001), "Dissociation of sulfur hexafluoride in the presence of an indoor combustion appliance," *Journal of Air & Waste Management Association*, Vol. 51, pp. 616-622.

Guo, Z. (2000), *Simulation Tool Kit for Indoor Air Quality and Inhalation Exposure (IAQX) Version 1.0 User's Guide*, U.S. Environmental Protection Agency, National Risk Management Research Laboratory, Research Triangle Park, NC, Report No. EPA-600/R-00-094 (NTIS PB2001-101221), 76 pp.

Guo, Z. (2000), "Development of a Windowed-based indoor air quality simulation package," *Environmental Modeling & Software*, Vol. 15, No. 4, pp. 403-410.

Guo, Z., Mosley, R., McBrien, J., and Fortmann, R. (2000), "Fine particulate matter emissions from candles," in *Engineering Solutions to Indoor Air Quality Problems Symposium*, VIP-98, Air & Waste Management Association, Pittsburgh, PA, July 2000, pp 211-225.

Guo, Z., Chang, J. C. S., Sparks, L. E., and Fortmann, R. C. (1999), "Estimation of the rate of VOC emissions from solvent-based indoor coating materials based on product formulation," *Atmospheric Environment*, Vol. 33, No. 8, pp. 1205-1215.

Guo, Z., Chang, J. C. S., Krebs, K. A., and Fortmann, R. C. (1999), "Validation of predictive models for solvent-based coatings with data from a test house." *Indoor Air 99*, Vol. 5, pp 251-252..

Guo, Z., Tichenor, B. A., Sparks, L. E., and Chang, J. C. S. (1998) "Predicting the emissions of individual VOCs from petroleum-based indoor coatings," *Atmospheric Environment*, Vol. 32, No. 2, pp. 231-237.

NARRATIVE

Dr. Guo has 20-year experience in indoor air quality (IAQ) and exposure research and is specialized in source testing, modeling, and IAQ simulation. He has been involved in testing of various indoor pollution sources and characterizing the adsorption/desorption processes in buildings and test chambers. He participated in the drafting of the small chamber method (ASTM D-5116) and developed several fundamentally-based models for emissions from indoor sources. He is also the developer of the Simulation Tool Kit for Indoor Air Quality and Exposure (IAQX) - a Windows-based simulation package for indoor air. Dr. Guo's research focus in the next two years will be identification and characterization of major PFOA sources in the indoor environment.

BIOGRAPHICAL SKETCH

NAME: Ruth Gutjahr-Gobell

POSITION TITLE: Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Roger Williams University Bristol, RI	B.S.	1980	Marine Biology and Chemistry

PROFESSIONAL EXPERIENCE

1997- present Biologist, U.S. Environmental Protection Agency; National Health and Environmental Effects Laboratory Atlantic Ecology Division, Narragansett, RI
1995-1997 Biological Science Laboratory Technician, U.S. Environmental Protection Agency; National Health and Environmental Effects Laboratory Atlantic Ecology Division, Narragansett, RI
1986-1995 Biologist, Science Applications International Corporation (SAIC), Narragansett, RI
1985-1986 Physical Science Lab Technician, National Marine Fisheries Service; NOAA, Narragansett, RI
1983-1985 Research Assistant, New England Aquarium, Grant, Narragansett, RI
1982-1983 Research Assistant, University of Rhode Island, Cooperative Agreement, Narragansett, RI
1981-1982 Research Assistant, Ecosystems Center, Marine Biological Lab, Woods Hole, MA
1981 Research Assistant, National Marine Fisheries Service Center, NOAA, Woods Hole, MA

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Environmental Toxicology and Chemistry
Society of Environmental Toxicology and Chemistry, North Atlantic Chapter

SELECTED AWARDS AND HONORS

RI Governor's Commendation for participation in Rhode Island Oil Spill Assessment, 1999
RI Governor's Commendation for participation in outstanding support of education through participation in the SMILE high school Hydroville program, 2004
EPA Scientific and Technical Advancement Award (STAA) for Publications, 2000, 2001, 2002, 2005

PUBLICATIONS

Gutjahr-Gobell RE, Zaroogian GE, Borsay Horowitz DJ, Gleason, TR Mills LJ. 2006. Individual effects of estrogens on a temperate reef fish, cunner (*Tautogolabrus adspersus*), extrapolated to the population level. R.E Gutjahr-Gobell, G. Zaroogian, D. Borsay Horowitz, T. Gleason, L.J. Mills. *Ecotoxicology and Environmental Safety*. 63:244-252.

Mills LJ, Gutjahr-Gobell RE, Borsay Horowitz DJ, Chow M, Denslow N, Zaroogian GE. 2003. Relationship between reproductive success and male plasma vitellogenin concentrations in cunner *Tautogolabrus adspersus*. *Env. Health Perspectives*. 111:93-99. EPA STAA III

Nacci DE, Gleason TR, Gutjahr-Gobell R, Huber M, Munns Jr WR. 2002. Effects of chronic stress on wildlife populations: A population modeling approach and case study. In: *Coastal and Estuarine Risk Assessment*. (Eds: Newman MC, Roberts Jr. MH, Hale RC). CRC Press/Lewis Publishers, Washington, DC. p. 247-272. EPA STAA Honorable Mention

Gutjahr-Gobell, RE, Huber M, Borsay Horowitz D, Zaroogian G, Mills LJ. 2002. A temperate reef fish *Tautogolabrus*

- adspersus* as a potential model species for laboratory studies evaluating effects of chemical exposure. *Environ Tox and Chem.* 21:380-389.
- Mills LJ, Gutjahr-Gobell RE, Borsay-Horowitz D, Haebler R, Pruell R, Jayaraman S, McKinney R, Zaroogian G. 2001. Effects of selected endocrine disrupting chemicals on GSI, HSI, plasma steroid hormone levels and vitellogenin production in juvenile summer flounder. *Aquatic Tox* 52:157-176.
- Gutjahr-Gobell RE, Black DE, Mills L, Pruell R, Taplin BK, Jayaraman S. 1999. Feeding the mummichog, *Fundulus heteroclitus*, a diet spiked with non-*ortho* and mono-*ortho*-substituted polychlorinated biphenyls: Accumulation and effects. *Environ Tox and Chem* 18:699-707.
- Gutjahr-Gobell, RE. 1998. Growth of juvenile and egg production of mummichogs fed different diets in the laboratory. *The Progressive Fish-Culturist.* 60:267-283.
- Black DE, Gutjahr-Gobell R, Pruell R, Bergen B, McElroy AE. 1998. Effects of a mixture of non-*ortho*- and mono-*ortho*-polychlorinated biphenyls on reproduction in *Fundulus heteroclitus* (Linnaeus). *Environ Tox and Chem* 17:1396-1404. EPA STAA III
- Black DE, Gutjahr-Gobell R, Pruell R, Bergen B, Mills L, McElroy AE. 1998. Reproduction and polychlorinated biphenyls in *Fundulus heteroclitus* (Linnaeus) from New Bedford Harbor, Massachusetts, USA. *Environ Tox and Chem* 17:1405-1414. EPA STAA III
- Munns WR, Black DE, Gleason TR, Salomon K, Bengtson D, Gutjahr-Gobell R. 1997. Evaluation of the effects of dioxin and PCBs on *Fundulus heteroclitus* populations using a modeling approach. *Environ Tox and Chem* 16:1074-1081.
- Pesch CE, Munns WR, Gutjahr-Gobell RE. 1991. Effects of a contaminated sediment on life history traits and population growth rate of *Neanthes arenaceodentata* (Polychaeta: Nereidae) in the laboratory. *Environ Tox and Chem.* 10:805-815.
- Zaroogian, G.E., Mills, L.J., Gutjahr-Gobell, R.E. Horowitz, D., Jayaraman, S., Cantwell, M., Collins, A., Chishester, C.O. An Injectable Slow-Release Implantation Method for Exposing Fish to Chemicals over a period of Weeks. (In Review).
- Mills, L.J., Gutjahr-Gobell, R.E., Laws, S.C., Jayaraman, S., Pruell, R.J., Zaroogian, G.E. Effects of Atrazine on aromatase activity and reproductive parameters in a marine fish, *Tautogolabrus adspersus*. (In Review).
- Mills, L.J., Gutjahr-Gobell, R.E., Laws, S.C., Jayaraman, S., Borsay Horowitz, D., R.J., Zaroogian, G.E. Effects of estrogens on reproductive parameters in a marine fish, *Tautogolabrus adspersus*. (In Review).
- Mills, L.J., Gutjahr-Gobell, R.E. Horowitz, D., Jayaraman, S., Cantwell, M., Collins, A., Zaroogian, G.E., Chishester, C.O. Modulation of aromatase activity as a mode of action for endocrine disrupting chemicals in a marine fish. (In Review).

BIOGRAPHICAL SKETCH

NAME: Laurence J. Helfant

POSITION TITLE: Scientist IV

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Drexel University (formerly Drexel Institute of Technology)	B.S. M.S. Ph.D.	1968	Chemistry

PROFESSIONAL EXPERIENCE

June 2005 - present – Scientist IV, Senior Environmental Employment Program, Method Development and Applications Branch, US EPA, Research Triangle Park, NC – Responsible for HPLC/GC/MS method development and technical support for analysis of xenobiotic compounds, focusing on pesticides and perfluorinated compounds. Provided regulatory guidance and daily laboratory support for on-going studies.

January 1999-June 2003 **B** Manager, Analytical Chemistry, Formulations Development Group, Aventis CropScience/Bayer CropScience, Research Triangle Park, NC **B** Responsible for Product Chemistry submissions for EPA and Agriculture Canada in accordance with 40CFR158 and 160 regulations, Product Chemistry Pesticide Assessment Guidelines (OPPTS 830 Series) and appropriate Canadian Directives; Formulation testing and container evaluation for stability under ambient and accelerated conditions; Analytical method development and validation to support and defend regulatory submissions and patent litigation, formulation development, and manufacturing quality control; Maintenance of laboratory in compliance with EPA GLP requirements, as outlined in 40CFR160. Management responsibilities were as Team Leader of Analytical services for Formulation Development which includes: Analytical project management to support formulation development, both GLP and non-GLP studies; contract management and internal study director for GLP studies in accordance with regulatory and safety requirements; supervision of Analytical Team personnel to insure proper training in instrumentation, methodology, regulatory compliance and company policy to satisfy customer needs; development and maintenance of analytical group budget; maintain and serve as resource for EPA regulatory requirements for product chemistry; overall responsibility for development and maintenance of Formulation Library. With Bayer's acquisition of Aventis CropScience, primary responsibilities included a transition of technology and preparation of an analytical group within the Formulation Development Group at the Bayer CS Hawthorn facility, Kansas City, MO.

January 1993-December 1998 **B** Principal Scientist, Formulation Development, Rhône-Poulenc Ag Company, Research Triangle Park, NC **B** Technical and management responsibilities similar to those outlined for Aventis/Bayer job position with addition of interaction with EPA and ACPA workgroups. Analytical method development and validation to support formulation development, product specifications and quality control. Industry representative on EPA/ACPA workgroup to modify Confidential Statement of Formula and OPPTS 830 Series guidelines.

January 1987-December 1992 **B** Research Scientist, Analytical Chemistry, Rhône-Poulenc Ag Company, Research Triangle Park, NC **B** Responsible for HPLC/GC method development; analytical support for International Generic Infringement Program; HPLC/GLC method development for ppb determinations of pesticides to support California/Arizona Data-In; establishment of Analytical procedures and Study protocols, according to EPA Good

Laboratory Practice (GLP); study Director management for Product Chemistry, Residue study generation to support Registration submissions

October 1981-December 1986 **B** Senior Chemist, Quality Assurance and Technical Service, Union Carbide Agricultural Products Company (UCAPC), Research Triangle Park, North Carolina **B** Responsible for method development and technical support for QC laboratories at UCAPC plants at St. Joe, MO and Ambler, PA; general analytical support for Formulation Group and field personnel; program monitor and expert analytical witness for worldwide infringement program for proprietary compounds; Associate Referee for AOAC for herbicide method collaboration and publication.

January 1979-September 1981 **B** Registration Specialist, Office of Regulatory Affairs, Union Carbide Agricultural Products Company (UCAPC), Ambler, PA **B** Responsible for chemistry review and compilation of registration dossier for EPA submission; state legislative contact with National Agricultural Chemical Association (NACA); EPA reregistration of phenoxy products for compliance with AOAC specific isomer methodology.

January 1977-December 1978 **B** Senior Quality Control Chemist, Formulation Development, Union Carbide Agricultural Products Company (UCAPC), Ambler, PA **B** Provided raw material quality testing and approval and daily production analysis. Provided product method development for formulation development and manufacturing quality control. Investigated complaints relating to product quality from customers, government agencies and private laboratories.

May 1971-December 1976 **B** Quality Control Chemist, Manufacturing, Amchem Products, Inc., Ambler, PA **B** Provided method development and analysis to support small scale synthesis. Analyzed and approved daily batch production.

June 1968-April 1971 **B** Analytical Chemist, Technical Service, Rohm and Haas Company, Bristol, PA **B** Responsible for general method development for petroleum products and acrylic polymers. Adapted pesticide methods for residues to a broad spectrum of crops.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Association of Official Analytical Chemists (AOAC), Associate Referee for Bromoxynil
Croplife America (formerly American Crop Protection Association or ACPA), Industry Representative
EPA Workgroup Committee for OPPTS Product Chemistry Guideline revisions, Industry Representative

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Input to SAP and consultation with EPA workgroup on the draft publication of EPA Pesticide Assessment guidelines (OPPTS 830 Series) for conduct and submission of Product Chemistry studies (1989)
Industry representative for EPA workgroup on the revision of the Pesticide Confidential Statement of Formula (40CFR Part 158 §158.175)

PUBLICATIONS

Helfant, Laurence J., **B**Bromoxynil Octanoate in Pesticide Formulations[®], Journal of Association of Official Analytical Chemists, 62, 1215 (1979).

BIOGRAPHICAL SKETCH

NAME: Michael J. Hemmer

POSITION TITLE: Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Florida State University, Department of Biology, Tallahassee, FL	B.S.	1978	Biology
University of West Florida, Department of Mathematics, Pensacola, FL	M.S.	1988	Statistics
University of Mississippi, Department of Pharmacology and Toxicology, Oxford, MS	Ph.D.	1996	Toxicology

PROFESSIONAL EXPERIENCE

2004-present	Research Biologist, Biological Effects and Population Response Branch, Gulf Ecology Division, National Health and Environmental Effects Research Laboratory (NHEERL), Office of Research and Development (ORD), U.S. Environmental Protection Agency (USEPA), Gulf Breeze, Florida.
2002-2004	Acting Branch Chief, Biological Effects and Population Response Branch. Gulf Ecology Division, NHEERL, ORD, USEPA, Gulf Breeze, Florida.
2000-2002	Research Biologist, EcoRisk Team Leader, Biological Effects and Population Response Branch, Gulf Ecology Division, NHEERL, ORD, USEPA, Gulf Breeze, Florida.
1989-2000	Research Biologist, Ecotoxicology Branch, Gulf Ecology Division, NHEERL, ORD, USEPA, Gulf Breeze, FL.
1983-1989	Biologist, Toxicology Branch, Gulf Breeze Environmental Research Laboratory, Office of Environmental Processes and Effects Research (OEPER), ORD, USEPA, Gulf Breeze, FL.
1980-1983	Biological Technician, Toxicology Branch, OEPER, ORD, USEPA, Gulf Breeze, FL.
1979-1980	Chemist, American Cyanamid Company, Pensacola, FL.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Environmental Toxicology and Chemistry

Society of Toxicology

SELECTED AWARDS AND HONORS

USEPA Performance Awards – 1978, 1987, 1994, 1998, 2001

USEPA Special Accomplishment Awards – 1994, 1995, 1998, 2001 (2), 2002, 2003 (2).

USEPA Scientific and Technological Achievement Award (2004) Honorable Mention

USEPA Bronze Medal (2000) Development of estrogen-responsive gene array for fish.

USEPA Bronze Medal (2004) Hurricane Ivan Recovery

INVITED LECTURES/SYMPOSIA

88th Annual Meeting of the Ecological Society of America, August 2003, Savannah, GA.

International Ecotoxicogenomics Workshop: Ecological Perspective of Genomics: Assessing Ecological Risk through Partnerships, September 23-25, 2002, Pensacola Beach, Florida, USA

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

International Ecotoxicogenomics Workshop: Ecological Perspective of Genomics: Assessing Ecological Risk through Partnerships, September 23-25, 2002, Pensacola Beach, Florida, USA

OECD/IPCS Workshop on Toxicogenomics, October 13-15, 2004, Kyoto, Japan.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

NHEERL Toxicogenomics Core Advisory Workgroup, Present
NHEERL Computational Toxicology Implementation Workgroup 2004-2005
NHEERL Safe Pesticides/Safe Products Implementation Workgroup 2004-Present
NHEERL Endocrine Disruptors Implementation Plan Workgroup, 1999 - 2000
USEPA Genomics Action Plan Workgroup, 2002
NHEERL Computational Toxicology Workgroup, 2002
NHEERL Aquatic Stressor Workgroup - Toxic Chemical Subgroup, 2000-2001

PUBLICATIONS

- Walker, C. C., K. A. Salinas, P.S. Haris, S.S. Wilkinson, J. Watts, M.J. Hemmer. 2006. A proteomic (SELDI-TOF-MS) approach to estrogen agonist screening. *Toxicol. Sci.* (In press)
- Knoebel, I., J.L. Blum, M.J. Hemmer, N.D. Denslow. 2006. Temporal gene induction patterns in sheepshead minnows exposed to 17 β -estradiol. *J. Exp. Zool. Part A Comp. Exp. Biol.* 305:707-719.
- Knoebel, I., M.J. Hemmer, N.D. Denslow. 2004. Induction of zona radiata proteins and vitellogenins in estradiol and nonylphenol exposed male sheepshead minnows (*Cyprinodon variegatus*). *Mar. Environ. Res.* 58:547-551.
- Larkin, P., L.C. Folmar, M.J. Hemmer, A.J. Poston, N.D. Denslow. 2003. Expression profiling of estrogenic compounds using a sheepshead minnow cDNA macroarray. *Environ. Health Perspect.* 111:839-846.
- Larkin, P, L.C. Folmar, M.J. Hemmer, A.J. Poston, H.S. Lee, N.D. Denslow. 2002. Array technology as a tool to monitor exposure of fish to xenoestrogens. *Marine Environ. Res.* 54:395-399.
- Folmar, L.C., M.J. Hemmer, N.D. Denslow, K.Kroll, J. Chen, A. Cheek, H. Richman, H. Meredith, and E. G. Grau. 2002. A comparison of the estrogenic potencies of estradiol, ethinylestradiol, diethylstilbestrol, nonylphenol and methoxychlor in vivo and in vitro. *Aquat. Toxicol.* 60:101-110.
- Hemmer, M.J., C.J. Bowman, B.L. Hemmer, S.D. Friedman, K.J. Kroll, and N.D. Denslow. 2002. Vitellogenin mRNA regulation and plasma clearance in male sheepshead minnows, (*Cyprinodon variegatus*) after cessation of exposure to 17 β -estradiol and p-nonylphenol. *Aquat. Toxicol.* 58:99-112.
- Denslow, N.D., H.S. Lee, C.J. Bowman, M.J. Hemmer, L.C. Folmar. 2001. Multiple responses in gene expression in fish treated with estrogen. *Comp. Biochem. Physiol. Part B*, 129: 277-282.
- Denslow, N.D., C.J. Bowman, R.J. Ferguson, H.S. Lee, M.J. Hemmer and L.C. Folmar. 2000. Induction of gene expression in sheepshead minnows (*Cyprinodon variegatus*) treated with 17 β -estradiol, diethylstilbestrol or ethinylestradiol: The use of mRNA fingerprints as an indicator of gene regulation. *Gen. Comp. Endocrinol.* 121:250-260.
- Hemmer, M.J., B.L. Hemmer, C.J. Bowman, K.J. Kroll, L.C.Folmar, D. Marcovich, M.D. Hoglund, and N.D.Denslow. 2001. Effects of p-nonylphenol, methoxychlor and endosulfan on vitellogenin induction and expression in the sheepshead minnow, *Cyprinodon variegatus*. *Environ. Toxicol. Chem.* 20(2):336-343.
- Bowman, C.J., K.J. Kroll, M.J. Hemmer, L.C. Folmar, and N.D. Denslow. 2000. Estrogen-induced vitellogenin mRNA and protein in sheepshead minnow (*Cyprinodon variegatus*). *Gen. Comp. Endocrinol.* 120(3):300-313.
- Curtis, L.R., M.J. Hemmer and L.A. Courtney. 2000. Dieldrin induces cytosolic 7,12-[3H]dimethylbenz[a]anthracene binding but not multidrug resistance proteins in rainbow trout liver. *J. Toxicol. Environ. Health., Part A*, 60:275-289.

- Folmar, L.C., M.J. Hemmer, R.L. Hemmer, C. Bowman, K. Kroll, and N.D. Denslow. 2000. Comparative estrogenicity of estradiol, ethynyl estradiol and diethylstilbestrol in an in vivo, male sheepshead minnow (*Cyprinodon variegatus*), vitellogenin bioassay. *Aquat. Toxicol.*, 49:77-88.
- Hemmer, M.J., L.A. Courtney, and W.H. Benson. 1998. Comparison of three histological fixatives on the immunoreactivity of mammalian P-glycoprotein antibodies in the sheepshead minnow, *Cyprinodon variegatus*. *J. Exp. Zool.* 281:251-259.
- Hemmer, M.J., L.A. Courtney, and L.S. Ortego. 1995. Immunohistochemical detection of P-glycoprotein in teleost tissues using mammalian polyclonal and monoclonal antibodies. *J. Exp. Zool.* 272:69-77

NARRATIVE

Past research efforts focused on the effects of natural, pharmaceutical and xenoestrogenic chemicals on the sheepshead minnow, EPA's small estuarine fish model. This research resulted in development of an ELISA assay for plasma vitellogenin and an estrogen-responsive cDNA macroarray for this species. These tools were useful in examining other chemicals for endocrine disrupting activity and were used in field assessment designed to detect the presence of biologically active levels of estrogen-active compounds in the environment. Current research efforts are exploring the utility of protein expression profiling as a rapid and cost effective means to screen large chemical inventories for specific pathways of toxicity. We are currently investigating the use of mass spectrometry to examine protein patterns associated with exposure to chemicals with defined modes of action, using endocrine disrupting compounds as a proof of concept. Samples from control and chemically exposed fish are applied to protein chip arrays to produce spectral protein fingerprints which are characteristic for a specific toxicity pathway. Protein patterns indicative of specific chemical effects are determined using a combination of proprietary pattern recognition software and commercially available statistical packages. Specific protein profiles generated for known chemical modes of action (MOA) are then incorporated into predictive pattern recognition libraries. Chemicals with unknown properties, or tissues supplied from field collected organisms can then be evaluated based on comparison of their protein signature to the established libraries. Detection of multiple MOAs through protein expression libraries presents a viable option for ultimately replacing many of the single MOA based in vivo mammalian tests currently used in safety assessment and would greatly reduce the animal numbers needed for such assessments.

BIOGRAPHICAL SKETCH

NAME: James A. Hetrick

POSITION TITLE: Senior Chemist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
West Virginia University	B.S.	1979	Soil Science
West Virginia University	M.S.	1985	Soil Science
Kansas State University	Ph.D.	1989	Soil Chemistry

PROFESSIONAL EXPERIENCE

- 1998- Present Senior Chemist United States Environmental Protection Agency, Office of Pesticides Programs (OPP), Environmental Fate and Effects Division (EFED), Washington, DC
- 1989 – 1998 Chemist United States Environmental Protection Agency, Office of Pesticides Programs (OPP), Environmental Fate and Effects Division (EFED), Washington, DC
- 1985 - 1989 Research Assistant in Soil Chemistry
Department of Agronomy, Kansas State University, Manhattan, KS
- 1982 - 1985 Research Assistant in Soil Microbiology
Department of Plant Pathology, Kansas State University, Manhattan, KS

INVITED LECTURES/SYMPOSIA

- Doelling Brown, P. and J.A. Hetrick. 2005. Spatially Explicit Aquatic Risk Assessment for Copper-Containing Pesticides. SETAC Meetings. Baltimore, MD.
- Hetrick, J.A. 2005. Incorporation of Stereochemistry in FIFRA and FQPA Pesticide Risk and Exposure Assessments. SIFREG Meeting. Crystal City, VA
- Nguyen, M-T.L., S.W. Abel, A. Al-Mudallal, J.A. Hetrick, and J.L. Ellis. 2004. Incorporation of Water Treatment Effects on Pesticide Removal and Transformations in Drinking Water Assessments-USEPA/OPP's Interim Science Policy. AWWA and International Water Association Meetings. Prague, Czech Republic.
- Hetrick, J.A. 2004. Interim Policy on Incorporation of Water Treatment Data into FQPA Drinking Water Assessments. USEPA Drinking Water Treatment Scientist-to-Scientist Meeting. Crystal City, VA.
- Hetrick, J.A. and J.K. Wolf. 2003. Preliminary Evaluation on the Use of Variography and Conditional Simulation for Estimating Daily Pesticide Concentrations. Environmental Modeling Working Group (EMWG). Crystal City, VA.
- Hetrick, J.A. 2001. Drinking Water Assessment Case Study. CARET Training, Crystal City, VA.
- Hetrick, J.A. 1999. Vadose Zone and Ground Water Monitoring Protocols for Ecological and Human Health Exposure Assessment. First International Conference on Pesticides in Soil, Ground and Surface Waters. Darmstadt, Germany.
- Thurman, N.C., J.A. Hetrick, J.K. Wolf, L.L. Parsons, P.J. Hannan, and W.R. Effland. 1997. Designing Lysimeter and Field Studies to Address Spatial Variability. American Chemical Society Meetings, San Francisco, CA.

Wolf, J.K., J.A. Hetrick, N.C. Thurman, L.L. Parsons, P.J. Hannan, and W.R. Effland. 1997. Does the Hydrology in a Lysimeter Agree with Field Soil Hydrology? American Chemical Society Meetings, San Francisco, CA.

Thurman N.C., J.A. Hetrick, L.L. Parsons, J.K. Wolf, W.R. Effland, M.R. Barrett and E. Behl. 1997. The Use of Lysimeter, Field and Ground-Water Monitoring Studies To Evaluate Pesticide Ground-Water Contamination Potential. American Chemical Society Meetings, San Francisco, CA.

Thurman, N.C., W.R. Effland, J.K. Wolf, and J.A. Hetrick. 1996. Using Stochastic Simulations of Spatially-Correlated Soil Properties to Model Pesticide Leaching Through the Vadose Zone. American Geophysical Union Spring Meetings, Baltimore, MD.

Wolf, J.K., J.A. Hetrick, and W.R. Effland. 1995. The Spatial Variability of Selected Soil Properties and their Influence on Pesticide Leaching. American Society of Agronomy Abstracts, Division of Environmental Quality (A5), St. Louis, MO.

Wolf, J.K., J.A. Hetrick, and W.R. Effland. 1994. Implications of Spatial Variability in Sampling Pesticide Residues in Soil. American Society of Agronomy Abstracts, Division of Environmental Quality (A5), Seattle, WA.

Effland, W.R., J.A. Hetrick, and J.W. Wolf. 1994. Application of Soil Taxonomic Groupings to Simulated Pesticide Leaching. American Society of Agronomy Abstracts, Division of Environmental Quality (A5), Seattle, WA.

Hetrick, J.A., J.K. Wolf, and W.R. Effland. 1994. Geostatistical Considerations of Soil Sampling Strategies for Pesticides. Eighth International Congress of Pesticide Chemistry Abstracts, American Society of Chemistry, Washington, D.C.

Hetrick, J.A., H. Jacoby, and W.R. Effland. 1994. Appropriate Design of Testing-Field Studies vs. Lysimeters. Pesticide Chemistry and Ecological Risks Workshop. Eighth International Congress of Pesticide Chemistry, American Society of Chemistry, Washington, D.C.

PUBLICATIONS

Blomquist, J.D., J.M. Davis, J.L. Cowles, J.A. Hetrick, R.D. Jones, and N.B. Birchfield. 2001. Pesticides in Selected Water-Supply Reservoirs and Finished Drinking Water. 1999-2000. Summary of Results from Pilot Monitoring Program USGS Open-File Report 01-456.

Hetrick, James A. and A. Paul Schwab. 1992. Influence of Long-term N and P Fertilization on Phosphorus and Aluminum Solubilities. *Soil Sci. Soc. Am. J.* 56(3):755-761.

Hetrick, Barbara A. Daniels, J. A. Hetrick, and J. Bloom. 1984. The Influence of Mycorrhizal Infection, Moisture Stress and Phosphorus on Field Corn Growth. *Canadian Journal of Botany.* 62(11):2267-2271.

BOOK CHAPTERS

Barrett, M. R., S. L. Liu, N. C. Thurman, J. A. Hetrick, L. L. Parsons, J. K. Wolf, and E. Behl. Evaluating Pesticide Fate and Transport: II. Mass Balance and Tracking. In F. Fuhr, Hance, R.J., and J. R. Plimmer. (ed.) *Comprehensive Tracer Studies on the Environmental Behavior of Pesticides: The Lysimeter Concept.* American Chemical Society, Washington, D.C.

Thurman N.C., J.K. Wolf, M.R. Barrett, J.A. Hetrick, L.L. Parsons, L. Liu, W.R. Effland and E. Behl. The Use of Lysimeter, Field, and Ground-Water Monitoring Studies to Evaluate Pesticide Fate and Transport. In F. Fuhr, Hance, R.J., and J. R. Plimmer. (ed.) *Comprehensive Tracer Studies on the Environmental Behavior of Pesticides: The Lysimeter Concept.* American Chemical Society, Washington, D.C.

Mastradone, P.J., J. Breithaupt, P.J. Hannan, J.A. Hetrick, A.W. Jones, R. David Jones, R.J. Mahler, S. Syslo, and J.K.

Wolf. 1995. Critical assessment of terrestrial field dissipation guidelines. In M.L. Leng, E.M.K. Leovey, and P.J. Zubkoff (ed.) *Agrochemical Environmental Fate Studies: State of the Art*. Lewis Publishers, Boca Raton, FL. Division of Agrochemicals. Washington D.C.

BIOGRAPHICAL SKETCH

NAME: Vance Ross Highsmith POSITION TITLE: Assistant Laboratory Director

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of North Carolina, Chapel Hill	B.A.	1968	Chemistry/Mathematics
University of North Carolina, Chapel Hill	M.S.	1974	Chemistry

PROFESSIONAL EXPERIENCE

Assistant Laboratory Director, NERL, ORD	October 2000 - present
Chief, Human Exposure Analysis Branch, NERL, ORD	February 1997 - October 2000
Acting Director, Atmospheric Methods Research Division, AREAL, ORD	October 1996 - February 1997
Chief, Methods Branch, AMRD, AREAL, ORD	January 1995 - October 1996
Chief, Indoor Air Research Section, HEFRD, AREAL, ORD	January 1992 - January 1995
Physical Scientist in various ORD Organizations (AREAL, EMSL, QAEML)	January 1975 - January 1992

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

International Society of Exposure Analysis

SELECTED AWARDS AND HONORS

Scientific and Technological Achievement Award (1998). Characterizing Indoor Particle Concentrations Associated with the Use of Tap Water in Portable Humidifiers

OPPT Mission Award (2004) PFOA Workgroup

Bronze Medal

- 1985 - In recognition of outstanding efforts and performance in the development of PM-10 methodology and associated monitoring requirements
- 1994 - For developing innovative administrative and scientific approaches in assessing the indoor air quality of the three EPA headquarters buildings
- 1995 - For initiating and designing the world's first, largest and most complete database on indoor air quality in office buildings
- 2001 - In recognition of the NERL/NHEERL Panel Studies Research Team who designed and executed vital epidemiological/exposure particulate matter research studies
- 2004 - For leading ORD research planning by completing ORD multi-year plan to chart the course for future ORD research
- 2005 - For the outstanding development and design of a framework to implement research support in the FY 2008 planning process

INVITED LECTURES/SYMPOSIA

Evans, G.F., Highsmith, V.R., Sheldon, L.S., Suggs, J.C., Williams, R.W., Zweidinger, R.B., Creason, J.P., Walsh, D.B., Rodes, C.E., and Lawless, P.A. The 1999 Fresno particulate matter exposure studies: comparison of community, outdoor, and residential PM mass measurements. Presented at: PM 2000 AWMA Conference, Charleston, SC, January 24-28, 2000.

- Rodes, C.E., Lawless, P.A., Evans, G.F., Highsmith, V.R., Sheldon, L.S., Williams, R.W., Vette, A.F., and Creason, J.P. The relationships between personal PM exposures for elderly populations and indoor and outdoor concentrations for three retirement center scenarios. Presented at: PM 2000 AWMA Conference, Charleston, SC, January 24-28, 2000.
- Sheldon, L.S., Williams, R.W., Highsmith, V.R., Rodes, C.E., Creason, J.P., and Walsh, D.B. An overview of EPA's human exposure panel studies. Presented at: PM 2000 AWMA Conference, Charleston, SC, January 24-28, 2000.
- Sheldon, L.S., Williams, R.W., Zweidinger, R.B., Evans, G.F., Highsmith, V.R., Suggs, J.C., Rodes, C.E., and Creason, J.P. Lessons learned from four exposure panel studies: the U.S. EPA's particulate matter studies involving elderly cohorts. Presented at: PM 2000 AWMA Conference, Charleston, SC, January 24-28, 2000.
- Vette, A.F., Rea, A.W., Lawless, P.A., Rodes, C.E., Evans, G.F., Highsmith, V.R., Creason, J.P., and Sheldon, L.S. Indoor/outdoor aerosol concentration ratios during the 1999 Fresno particulate matter exposure studies as a function of size, season, and time of day. Presented at: PM 2000 AWMA Conference, Charleston, SC, January 24-28, 2000.
- Wallace, L.A., Sheldon, L.S., Highsmith, V.R., Zweidinger, R.B., Suggs, J.C., and Williams, R. Human Exposure of High-Risk Subpopulations to Particulate Matter. Presented at: PM 2000 AWMA Conference, Charleston, SC, January 24-28, 2000.
- Cohen-Hubal, E.A., Highsmith, V.R., and Bond, A.E. Impact of Agricultural Use of Pesticides on Applicator Spouse and Children. Presented at: ISEA 2000 Exposure Analysis in the 21st Century: Integrating Science, Policy and Quality of Life, Monterey Peninsula, CA, October 24-27, 2000
- Leovic, K.W., Ejire, A., Williams, R.W., Highsmith, V.R., and Sheldon, L.S. Improving the scientific community's ability to characterize human exposures in low SES areas: participant recruitment and retention. Presented at: ISEA 2000 Exposure Analysis in the 21st Century: Integrating Science, Policy and Quality of Life, Monterey Peninsula, CA, October 24-27, 2000.
- Sheldon, L.S., Rea, A.W., Vette, A.F., Howard-Reed, C., Williams, R.W., Highsmith, V.R., Rodes, C.E., and Lawless, P.A. The contribution of particle resuspension to indoor and personal air concentrations. Presented at: ISEA 2000 Exposure Analysis in the 21st Century: Integrating Science, Policy and Quality of Life, Monterey Peninsula, CA, October 24-27, 2000.
- Williams, R.W., Highsmith, V.R., Sheldon, L.S., Rea, A.W., Vette, A.F., Suggs, J.C., Leovic, K.W., Howard-Reed, C.,
Saunders, G., Ejire, A., Rodes, C.E., Thornburg, J., and Lawless, P.A. Preliminary findings from the NERL Research Triangle Park particulate matter panel study. Presented at: ISEA 2000 Exposure Analysis in the 21st Century: Integrating Science, Policy and Quality of Life, Monterey Peninsula, CA, October 24-27, 2000.
- Leovic, K.W., Highsmith, V.R., Sheldon, L.S., Williams, R.W., Cohen-Hubal, E.A., Morgan, M.K., Stout, II, D.M., and Ejire, A. Recruiting, retaining, and reporting exposure study results to participants and the public. Presented at: 11th Annual Meeting of the International Society of Exposure Analysis, Charleston, SC, November 4-8, 2001.
- Leovic, K.W., Sheldon, L.S., Thomas, K.W., Highsmith, V.R., Tulve, N.S., Robertson, G.L., Hammerstrom, K., Quackenboss, J.J., Melnyk, L.J., Berry, M., Pellizari, E., Lebowitz, M., and Ryan, P.B. Lessons learned from the National Human Exposure Assessment Survey (NHEXAS). Presented at: International Society of Exposure Analysis 2002 Conference, Vancouver, Canada, August 11-15, 2002.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Lead Author, Safe Food Multiple Year Plan
 NERL Representative, Pesticides/Toxics Research Coordination Team
 NERL Representative, Multimedia Research Coordination Team
 NERL Representative, Human Health Workgroup, Multimedia Research Coordination Team
 NERL Representative, EDCs Workgroup, Multimedia Research Coordination Team
 ORD Lead, Technical Support for OPPT/OPPTS PFOA Enforceable Consent Agreement Negotiations

ORD Lead , Characterization of Pesticide Exposures in US Daycares and Residences (collaborative study with HUD and CPSC)

NERL Lead, Technical Support for EPA Asbestos Coordination Team research plan

NERL Lead, ORD Indoor Air Research Program

NERL Lead, EPA Large Buildings Research Program

NERL Lead, Investigation of Indoor Air Quality at EPA Headquarters Buildings

NERL Lead, Investigation of Indoor Air Quality at Library of Congress

NERL Lead, Integrated Air Cancer Project

PUBLICATIONS

Evans, G.F., Highsmith, V.R., Sheldon, L.S., Suggs, J.C., Williams, R.W., Zweidinger, R.B., Creason, J.P., Walsh, D., Rodes, C.E., and Lawless, P.A. The 1999 Fresno particulate matter exposure studies: comparison of community, outdoor, and residential PM mass measurements. Journal of the Air & Waste Management Association 50 (11):1887-1896 (2000). EPA/600/J-01/268.

Vette, A.F., Rea, A.W., Lawless, P.A., Rodes, C.E., Evans, E.G., Highsmith, V.R., Creason, J.P., and Sheldon, L.S. Characterization of indoor-outdoor aerosol concentration relationships during the Fresno PM exposure studies. Aerosol Science and Technology 34 (1):118-126 (2001). EPA/600/J-01/114.

Williams, R.W., Wallace, L.A., Suggs, J.C., Evans, E.G., Creason, J.P., Highsmith, V.R., Sheldon, L.S., Rea, A.W., Vette, A.F., Zweidinger, R.B., Leovic, K.W., Norris, G.A., Landis, M.S., Howard-Reed, C., Stevens, C., Conner, T.L., Rodes, C.E., Lawless, P.A., Thornburg, J., Liu, L.J.S., Kalman, D., Kaufman, J., Koenig, J.Q., Larson, T.L., Lumley, T., Sheppard, L., Brown, K., Suh, H., Wheeler, A., Gold, D., Koutrakis, P., and Lippmann, M. Preliminary particulate matter mass concentrations associated with longitudinal panel studies "assessing human exposures of high risk subpopulations to particulate matter". 2001. EPA/600/R-01/086 (NTIS PB2002-100444).

BIOGRAPHICAL SKETCH

NAME: Michael W. Hornung POSITION TITLE: Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Wisconsin – Stevens Point	BS	1988	Biology
University of Wisconsin – Madison	PhD	1998	Environmental Toxicology

PROFESSIONAL EXPERIENCE

Employment:

2005-Present Toxicologist, U.S. EPA, Duluth, MN
2000-2005 Post-Doctoral Program, U.S. EPA, Duluth, MN
1998-2000 National Research Council-Post-Doctoral Research Associate, U.S. EPA, Duluth, MN
1989-1990 High School Chemistry and Biology Teacher, Berlin High School, Berlin, WI
1989 High School Science Teacher, Wausau School District "At Risk" Program, Wausau, WI

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Toxicology 1992- present
Society of Environmental Toxicology and Chemistry 1991-present
Editorial Board (Aquatic Toxicology Section) - *Environmental Toxicology and Chemistry*, 2000-2003

INVITED LECTURES/SYMPOSIA

Hornung, M.W., K.R. Thoenke, J.J. Korte, J.A. Serrano, J.W. Nichols, P.K. Schmieder, J.E. Tietge, and S.J. Degitz. A systems approach to characterizing and predicting thyroid toxicity. *The McKim Conference on the Use of QSARs and Aquatic Toxicology in Risk Assessment, June 27-29, 2006, Duluth, MN.*

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

EPA Report:

Ankley G., Jensen, K., Hornung, M., Kahl, M., Korte, J., Makynen, E. U.S. Environmental Protection Agency. 2001. A short-term method for assessing the reproductive and developmental toxicity of endocrine-disrupting chemicals using the fathead minnow (*Pimephales promelas*). EPA-600/R-01/067. Duluth, MN.

PUBLICATIONS

Hornung, M. W., Cook, P.M., Fitzsimmons, P. N., Kuehl, D. W., Nichols, J. W. Tissue distribution and metabolism of benzo[a]pyrene in embryonic and larval medaka (*Oryzias latipes*). In In-house review Sept 1, 2006. Submit to Toxicological Sciences Oct 2006

Denny, J.S., Tapper, M.A., Schmieder, P.K., Hornung, M.W., Jensen, K.M., Ankley, G.T., Henry, T.R. 2005. Comparison of relative binding affinities of endocrine active compounds to fathead minnow and rainbow trout estrogen receptors. *Environ. Toxicol. Chem.* 24, 2948-2953.

Hornung, M.W., Flynn, K.M., Johnson, R.D., Cook, P.M., Nichols, J. W. (2004) Use of multiphoton laser scanning microscopy to image benzo[a]pyrene and metabolites in fish eggs. In *Multiphoton Microscopy in the Biomedical Sciences*, Ammasi Periasamy, Peter T. C. So, (Eds). Proceedings of SPIE Vol.5323, pages 400-407.

Hornung, M.W., Cook, P.M., Flynn, K.M., Lothenbach, D.B., Johnson, R.D., Nichols, J.W. 2004. Use of laser-scanning multi-photon microscopy to describe the distribution of xenobiotic chemicals during fish early life stages. *Aquatic Toxicology*, 67, 1-11.

- Hornung, M.W., Jensen, K., Korte, J., Kahl, M., Durhan, E., Henry, T., Denny, J. Ankley, G. T. 2004. Mechanistic basis for estrogenic effects of methyltestosterone in fathead minnow: Evidence for conversion of 17 β -methyltestosterone to 17 β -methylestradiol. *Aquatic Toxicology*, 66, 15-23
- Hornung, M.W., Schmieder, P. K., Ankley, G.T. 2001. Induction of an estrogen-responsive reporter gene in rainbow trout hepatoma cells (RTH 149) at 11 or 18°C. *Environmental Toxicology and Chemistry*, 22, 866-871.
- Ankley, G.T., Kahl, M.D., Jensen, K.M., Hornung, M.W., Korte, J.J., Makynen, E.A., Leino, R. 2002. Evaluation of the aromatase inhibitor fadrozole in a short-term reproduction assay with the fathead minnow (*Pimephales promelas*). *Toxicological Sciences*, 67, 121-130.
- Hornung, M.W. , Spitsbergen, J. M. and Peterson, R.E. (1999). 2,3,7,8-Tetrachlorodibenzo-p-dioxin alters cardiovascular and craniofacial development and function in sac fry of rainbow trout (*Oncorhynchus mykiss*). *Toxicological Sciences*, 47, 40-51.
- Asplund, L., Hornung, M., Peterson, R.E., Turesson, K., Bergman, Å. (1999) Levels of polybrominated diphenyl ethers (PBDEs) in fish from the Great Lakes and Baltic Sea. In *Organohalogen Compounds*, 40, 351-354.

NARRATIVE

Research Areas: Effects of endocrine disrupting chemicals in aquatic systems. Development of in vitro assays for testing effects of chemicals on endocrine pathways. Interest in quantitative structure activity relationship models for endocrine disruption of steroid and thyroid hormone pathways.

BIOGRAPHICAL SKETCH

NAME: Rodney D. Johnson
Biologist

POSITION TITLE: Research

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
St Olaf College	B.S.	1975	Biology
University of Wyoming	M.S. Ph.D.	1983	Zoology

PROFESSIONAL EXPERIENCE

1983-1985 Postdoctoral Research Fellow; University of Alabama, Birmingham, AL
2003-present Adjunct Faculty Appointment; Integrated Biological Sciences - University of Minnesota, Duluth

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Toxicologic Pathology
American Association for the Advancement of Science

SELECTED AWARDS AND HONORS

U.S. EPA Bronze Medal; Support US EPA position in OECD EDC testing program; 2005
U.S. EPA Scientific and Technological Achievement Awards; 2000
U.S. EPA Dioxin Reassessment Research Planning Group; 1992-1995
Alabama Nephrology Research and Training Center, National Research Service Award, 1983-85

INVITED LECTURES/SYMPOSIA

Use of Small fish Models for assessing risks associated with EDCs, University of Georgia, Athens, GA. 2004
Workshop on *Online Toxicologic Methods for Evaluating Potential Chemical Risks Associated with Potable Reuse*
Invited presenter and participant by Water Environment Research Foundation (WERF). Alexandria, VA. 2001
Workshop on Chemically Induced Alterations in the Functional Development and Reproduction of Fishes,
Wingspread Conference, Racine, WI, 1995

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Histopathology Sub-Committee for OECD Fish Drafting Group, 2004-present
Technical Advisor for Water Environment Research Foundation (WERF). Appointed April 2002.
Co-PI on Cooperative Research and Development Agreement (CRADA) between The University of Minnesota, Duluth and the Mid-Continent Ecology Division. 2003 to Present
Colloquium on the use of Medaka in Risk Assessment processes. Duluth, MN 2002, Co-Organizer)
Workshop on Amphibian Deformities in the Central/Midwestern US, Duluth, MN 1998 (Organizer)
Workshop on Ecological Effects of Endocrine Disruptors, Duluth, MN. Co-chair, 1995
Workshop on Research Needs in Endocrine Disruption, Raleigh, NC. Invited participant, 1995

IJC/USEPA/USFWS Workshop on *in Vitro* Tests to Predict Sediment Carcinogenicity, Duluth, MN. Co-Chair, 1989

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Coordinate EPA fish histopathology protocols for OECD, VMG-Eco, Fish Drafting Group of EDC testing protocols, 2004 to Present.

Present MED EDC program at BOSC review of ORD EDC MYP, 2005.

Presented MED EDC program at ORD EDC program review, 2004.

PUBLICATIONS

Winn, R., M. Norris, D.B. Lothenbach, K.M Flynn, D.E. Hammermeister, F.W. Whiteman, B.R. Sheedy, And R.D. Johnson. 2006. Sub-Chronic exposures to 1,1-dichloropropene induces frameshift mutations in ? transgenic medaka. *Mutation Research: Fundamental and Molecular Mechanisms of Mutagenesis* 595:52-59.

Fournie, J.W., M.J. Wolfe, J.C. Wolf, L.A. Courtney, R.D. Johnson, and W.E. Hawkins. 2005. Diagnostic Criteria for Proliferative Thyroid Lesions in Bony Fish. *Toxicol. Path.* 33:540-551.

Ankley, G.T. and R.D. Johnson. 2004. Small fish models for identifying and assessing the effects of endocrine-disrupting chemicals. *Inst. Lab. Anim. Res. J.*, 45(4): 469-483.

Hornung, M., K. Flynn, R. Johnson, P. Cook, J. Nichols. 2004. Use of multiphoton laser scanning microscopy to image benzo[a]pyrene and metabolites in fish eggs. In: *Multiphoton Microscopy in the Biomedical Sciences*, Ammasi Periasamy, Peter T. C. So, (Eds). *Proceedings of SPIE*, 5323: 400-407.

Hornung, M., P. Cook, K. Flynn, D. Lothenbach, R. Johnson, J. Nichols. 2004. Use of laser-scanning multi-photon microscopy to describe the distribution of xenobiotic chemicals during fish early life stages. *Aquatic Tox.*, 67: 1-11.

Schmieder, P.K. M. Tapper, A. Linnum, J. Denny, R. Kolanczyk and R. Johnson. 2000. Optimization of a precision-cut trout liver tissue slice assay as a screen for vitellogenin induction: comparison of slice incubation techniques. *Aquatic Toxicology* 49(4):251-268.

Johnson, R.D., J.E. Tietge, K.M. Jensen, J.D. Fernandez, D.L. Lothenbach, G.W. Holcombe, P. M. Cook, R. Drummond, S. Christ, D. Lattier, and D. Gordon. 1998. Toxicity of 2,3,7,8-TCDD to F1 generation brook trout (*Salvelinus fontinalis*) exposed via the parental generation. *Environ. Toxicol. Chem.* 17(12):2408-2421.

Ankley, G.T., R.D. Johnson, E.I. Toth, and N. Detenbeck. 1997. Development of a research strategy for assessing the ecological risk of endocrine disruptors. *Rev. Toxicol.* 1:231-267.

Gray, L.E., Jr., W.R. Kelce, T. Wiese, R. Tyl, K. Gaido, J. Cook, G. Klinefelter, D. Desaulniers, E. Wilson, T. Zacharewski, C. Waller, P. Foster, J. Laskey, J. Reel, J. Giesy, S. Laws, J. McLachlan, W. Breslin, R. Cooper, R. Di Giulio, R. Johnson, R. Purdy, E. Mihaich, S. Safe, C. Sonnenschein, W. Welshons, R. Miller, S. McMaster, T. Colborn. 1997. Endocrine screening methods workshop report: Detection of estrogenic and androgenic hormonal and antihormonal activity for chemicals that act via receptor or steroidogenic enzyme mechanisms. *Reprod Toxicol.* 11(5):719-50.

NARRATIVE

The general approach of my research program is to assess the dose-response of model and selected chemical agents, using multiple toxicity endpoints, measured at several levels of biological organization; from the molecular to the population-level. The protocols and data generated are used to develop sound ecological risk assessment strategies. My research goal is to provide linkages between short-term toxicity assessments and long-term outcomes, and to provide insight into how these linkages can be used to improve chemical risk assessments. Our current research program is developing these relationship using chemicals that impact the HPG-axis of the endocrine system and ultimately impact reproductive fitness. The tools employed include measurements of gene and protein expression, histopathology, behavioral analysis, fecundity, fertility, and gonadal development.

BIOGRAPHICAL SKETCH

NAME: Robert J. Kavlock

POSITION TITLE: Director

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Miami	B.S.	1973	Biology
University of Miami	Ph.D.	1977	Embryology

PROFESSIONAL EXPERIENCE

2005-Present Director, National Center for Computational Toxicology, ORD, USEPA
2004-2005 Special Assistant (Computational Toxicology) to NHEERL Director
1999-2000: Acting Associate Director for Health, NHEERL (June-January)
1989-2004: Director, Reproductive Toxicology Division, NHEERL, USEPA, RTP, NC
1981-1989: Chief, Perinatal Toxicology Branch, DTD, HERL, USEPA, RTP, NC
1979-1981: Res. Biologist, Perinatal Toxicology Branch, DTD, HERL, USEPA, RTP, NC
1977-1979: Research Associate, Dept. of Biology, Univ. of Miami, Coral Gables, FL
Adjunct Associate Professor, Department of Pharmacology, Duke University, NC
Adjunct Assistant Professor, Department of Zoology, NCSU, NC

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Toxicology, including Developmental and Reproductive Toxicology Specialty Section and the North Carolina Society of Toxicology; Teratology Society
Toxicological Sciences (1994-2000); Teratogenesis, Carcinogenesis and Mutagenesis (to 2003);
Journal of Toxicology and Environmental Health, Part B (current); Journal of Children's Health (2002-2005); Birth Defects Research, Part B (2003-present).

SELECTED AWARDS AND HONORS

US EPA Bronze Medals: 2004, Computational Toxicology Design Team, 1998, Harmonized Reproductive Testing Guidelines; US EPA Science Achievement Award, 1995, for efforts on validation of benchmark dose methodology; US EPA Scientific and Technological Achievement Awards: Level I, 1994; Level II, 1983, 1984, 1984, 1986, 1993; Level III, 1983, 1984, 1985, 1985, 1987, 1989, 1992, 1993 for various peer reviewed scientific publications; US EPA Silver Medal, 1985, for development of an *in vivo* screening procedure for developmental toxicity; Best Paper of the Year Award, Fundamental and Applied Toxicology, 1995; President, Teratology Society, 2001; President, Reproductive and Developmental Toxicology Specialty Section, 1997; President, North Carolina Society of Toxicology, 1999.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Organizing Committees: Developmental Toxicity Profiles, (1987-1991); NIEHS Conference on Current Developments in *in vitro* Teratology, 1989; NIEHS/EPA Workshops on Molecular Aspects of Developmental Process, 1992-1993; EPA/AIHC/ILSI Workshop of Benchmark Dose Methodology, 1993; CENR/EPA/Smithsonian Workshop to Evaluate Research Needs for Endocrine Disruptors, 1996-1997. NIEHS Workshop on Low Dose Risks to Humans of Endocrine Disruptors, 1998; Marine Mammal Commission Workshop on Contaminants, 1998; CMA/NIEHS/EPA Workshop on Research Needs for the Risk Assessment of Endocrine Disruptors, 1999. NTP/NIEHS Endocrine Disruptors Low-Dose Peer Review, 2000; EPA/NIEHS/ACC Scientific Frontiers in Developmental Toxicity Risk Assessment, 2002, EPA Workshop on a Framework for Computational Toxicology, 2003.

Symposiums/Education Courses Chaired: SOT Symposium: Pharmacokinetics in Risk Assessment for Developmental Toxicity, 1991; Teratology Society Continuing Education Course: Human Developmental Toxicants: Experimental and Epidemiological Evidence, 1994; Teratology Society Symposium: Endocrine Disrupting Effects in Humans and Wildlife, 1996; SOT Continuing Education Course: Normal and Abnormal Endocrine Control of Reproductive Development, 1997; SOT Workshop on Endocrine Disruptor Identification, 1998; Teratology Society Symposium on Computational Biology, 2004.

Expert Committees/Advisory Panels: WHO/IPCS Working Group on Principles for Evaluating Health Risks to Children, 2003-2006; Chair, WHO/IPCS and Japan MOE Workshop on Research Needs for Endocrine Disruptors, 2003; ILSI Workgroup on Human Framework for Using MOA Information to Evaluate Human Relevance of Animal Toxicity Data, 2002-2004; American Chemistry Council Focal Area Leader, Long Range Research Initiative, 2002- present; American Chemistry Council Science Policy Committee (Public Member), 2001- present; Reviewer, European Commission Framework Calls, 2001, 2002, 2004; American Chemistry Council Endocrine Implementation Planning Group (Public Member), 2000-present; Chair, NTP Center for Evaluation of Risk to Human Reproduction Expert Panel on Phthalates, 1999-2000 and re-evaluation of DEHP, 2005; Advisor, United Nations University Program on Endocrine Disruptors in the Coastal Environment of Southeast Asia, 1999-2003; US/EU Workshop on Endocrine Disruptor Research Needs, Rapporteur, 1999; NIOSH Working Group to Develop Research Priorities for Reproductive Epidemiology, 1999; IPCS/WHO Steering Group for International State-of-Science Assessment of Endocrine Disruptors, 1997-2002; NIH ALTX-4 Study Section, Standing Member, 1997-2001; CIIT Science Advisory Committee, 1996-2001; CIIT Endocrine Toxicology Technical Panel, 1996-2001; CENR/NSTC/OSTP/EOP Working Group on Endocrine Disruptors, 1995-2000; IARC Monograph Working Groups, Volumes 36, 41, 47, 54, 58, 73, and 79; IARC Handbooks of Cancer Prevention, Volumes 2 and 4; European Union/OECD Workshop to Identify Research Needs for Endocrine Disrupting Chemicals, 1996; MRC/IEH Review Panel on Effects of Environmental Estrogens, 1995; WHO/IPCS Working Group on the International Harmonization of Risk Assessment Guidelines for Reproductive and Developmental Toxicity, 1994; NTP Board of Scientific Councilors on Developmental and Reproductive Toxicology (1989-1993); Consultant, US Borax, Design of Developmental Toxicity Studies for Boric Acid, 1993-1994; Congressional testimony to Waxmen Hearing on Environmental Estrogens, 1993; Institute for Evaluating Health Risk (IEHR) Working Group on Evaluation of Reproductive and Developmental Toxicants, 1993

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Chair, EPA/ORD Computational Toxicology Design Team (2003) and Implementation Steering Group, 2004-present ; NHEERL Genomics Program Steering Committee, 2001-2002; Endocrine Disruptor Methods Validation Subcommittee (EPA FACA), 2001-2003; Co-Organizer, Japanese NIES/US EPA Workshop on EDCs, Tokyo, February 2000; NHEERL Human Health Research Strategy Implementation Team, 2001- 2005; Chair, NHEERL Branch Chief Career Ladder Committee, 1997-1998; Chair, ORD Endocrine Disruptor Research Strategy Committee, 1995-1998; Chair, EPA Workshop to Develop Research Needs for Endocrine Disruptors, 1995; Chair, HERL Communications Issues Committee, 1992; EPA Working Group on Harmonized Testing Guidelines for Reproductive and Developmental Toxicity, 1991-1999; Co-Chair, HERL(NHEERL) Technical Qualifications Board, 1989-1997; Co-Chair, ORD RIHRA Topic IV Subcommittee (Biologically Based Dose Response Models), 1988-1993; HERL/OHR Organizational Goals Committee, 1988; Chair, OHR/HERL Mission Statement Committee, 1987; EPA Working Group on Developmental Toxicity Testing Guidelines, 1984-1985.

PUBLICATIONS

(12 selected from more than 140)

- Martin, MT, Brennan, R, Hu, W, Ayanoglu, E, Lau, C, Ren, H, Wood, CR, Corton, JC, Kavlock, RJ and Dix, D. (2006). Toxicogenomic Study of Triazole Fungicides and Perfluoroalkyl Acids in Rat Livers Accurately Categorizes Chemicals and Identifies Mechanisms of Toxicity. *Toxicol. Sci.* (submitted).
- Dix, DJ, Houck, KA, Martin, MT, Richard, AM, Setzer, RW and Kavlock, RJ (2006). The ToxCast Program for Prioritizing Toxicity Testing of Environmental Chemicals. *Toxicol. Sci.*, in press.
- Kavlock, R, Barr, D, Boelkeheide, K, Breslin, W, Breyse, P, Chapin, R, Gaido, K, Hodgson, E, Marcus, M, Shea, K and Williams, P. (2006). NTP-CERHT Expert Panel update on the reproductive and developmental toxicity of di(2-ethylhexyl phthalate). *Repro. Toxicol.* 22:291-399.
- Kavlock, RJ, Ankley, GT, Collette, T, Francis, E, Hammerstrom, K, Fowle, J, Tilson, H, Schmieder, P, Veith, GD, Weber, W, Wolf, DC, and Young, D. (2005). Computational Toxicology: framework, partnerships and program development. *Repro. Tox.* 19:281-290.
- Kavlock, RJ and Cummings, A (2005). Mode of Action: Inhibition of Androgen Receptor Function-Vinclozolin-induced Malformations in Reproductive Development. *Crit. Rev. Tox.* 35:721-726 (2005).
- Kavlock, RJ and Cummings, A (2005). Mode of Action: Reduction of Testosterone Availability-Molinate-induced Inhibition of Spermatogenesis. *Crit. Rev. Tox.* 35:685-690 (2005).
- Cummings, A and Kavlock, RJ (2004). Gene-environment interactions: A review of effects on reproduction and development. *Critical Review in Toxicology* 34:461-485.
- Wery N, Narotsky MG, Pacico N, Kavlock RJ, Picard JJ, Gofflot F. (2003). Defects in cervical vertebrae in boric acid-exposed rat embryos are associated with anterior shifts of hox gene expression domains. *Birth Defects Res Part A* 67(1):59-67.
- Daston GP, Cook JC and Kavlock RJ (2003). Uncertainties for endocrine disruptors: our view of progress. *Tox. Sci.* 74:245-252
- Rockett JC, Kavlock RJ, Lambright C, Parks LG, Schmid JE, Wilson VS, Wood C and Dix DJ (2002). DNA arrays to monitor gene expression in rat blood and uterus following 17 β -estradiol exposure: biomonitoring environmental effects using surrogate tissues. *Tox. Sci.* 69:49-59
- Damstra T, Barlow S, Bergman A, Kavlock R and Van Der Kraak G, editors (2002). International Programme On Chemical Safety Global Assessment Of The State-Of-The-Science Of Endocrine Disruptors. World Health Organization, Geneva.
- Rogers, JM and RJ Kavlock (2001). Developmental toxicity. In: Casarett & Doull's Toxicology: The Basic Science of Poisons, 6th edition. Curtis D. Klaassen, editor. McGraw-Hill, Inc., New York, NY, 301-331.

NARRATIVE

Teratogenesis, developmental physiology/pharmacokinetics, reproductive toxicology, quantitative risk models; endocrine disruptors, computational toxicology

BIOGRAPHICAL SKETCH

NAME: John F. Kenneke

POSITION TITLE: Research Chemist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Iowa State University, Ames	B.S.	1987	Chemistry/Biology
Univ. of Illinois, Urbana	M.S.	1989	Organic Chemistry
Univ. of North Carolina, Chapel Hill	Ph.D.	1996	Environmental Chemistry

PROFESSIONAL EXPERIENCE

1998-Present United States Environmental Protection Agency (U.S. EPA), Athens, GA
1996-1998 National Research Council Associate, U.S. EPA, Athens, GA
1995; 1997 University of Kuopio, Finland, Visiting Researcher
1995-1996 Triangle Laboratories, Durham, NC, Chemist
1989-1996 University of North Carolina, Chapel Hill, Research/Teaching Assistant
1987-1989 University of Illinois, Urbana, Research/Teaching Assistant
1985-1989 Union Carbide/Allied Signal/Universal Oil Products, Summer Intern

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Chemical Society
Division of Environmental Chemistry, American Chemical Society
Remediation Technologies Development Forum (RTDF)
RTDF Permeable Reactive Barriers Action Team

SELECTED AWARDS AND HONORS

2006 NERL Special Achievement Award; Quality Assurance
2005 Recognized by EPA Acting Assistant Administrator for outstanding work on the technical evaluation panel for the Nuclear Magnetic Resonance (NMR) Spectrometer
2004 ORD Bronze Medal for training laboratory researchers in principles and practices of quality assurance/quality control
2004 Scientific and Technological Achievement Award (STAA), Honorable Mention
2000 ORD Bronze Medal for the development of an unparalleled data quality control program

INVITED LECTURES/SYMPOSIA

In Vitro Phase I Metabolism of the Triazole Fungicide Bromuconazole and its Four Enantiomers. American Chemical Society, 230th National Convention, August 2005
Development of Searchable Data Bases for OPP, U.S. EPA, Washington, D.C. January 2005
NMR-Based Metabonomics at U.S. EPA, Imperial College, London, UK, July 2004
Fate of Anthropogenic Chemicals During Drinking Water Treatment, U.S.EPA/OPP, Washington, D.C., January 2004
Titanium Dioxide Photocatalysis, Kemira Chemical Company, Pori, Finland, August 1995

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Lead a two year pilot field study at Dover Air Force Base (AFB), Delaware to provide kinetic measurements for the zero-valent iron mediated removal of halogenated solvents from groundwater. Results were used to design a full-scale

zero-valent iron permeable reactive barrier at Dover AFB.

Manuscript reviewer for *Environmental Science and Technology*, *Water Research*, and *Journal of Environmental Management*

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Project Officer for the acquisition of two, 600 MHz NMR spectrometers for ORD.

Part of a NERL workgroup to develop a training course for laboratory researchers in the principles and practices of quality assurance/quality control.

PUBLICATIONS

Kenneke, J. F.; McCutcheon, S. C. 2003. The use of pre-treatment zones with zero-valent iron for the remediation of chloroalkenes in an oxic aquifer. *Environmental Science and Technology*, 37: 2829-2835.

Kenneke, J. F.; Weber, E. J. 2003. Reductive dehalogenation of halomethanes in iron- and sulfate-reducing sediments. I. Reactivity pattern analysis. *Environmental Science and Technology* 37: 713-720.

Betz, E.; Budde, B.; Johnson, L.; Kenneke, J.; Kitchens, J.; Lumpkin, S.; Matinson, J. 2003. *NERL training for laboratory researchers: principles and practices of quality assurance/quality control*. Software based QA/QC training program

Weber, E. J.; Kenneke, J. F.; Hoferkamp, L. A. 2002. Reactivity of chemical reductants as a function of redox zonation. *Groundwater Quality: Natural and Enhanced Restoration of Groundwater Pollution*. Thorton, S. F. and Oswald, S. E. eds., IAHS Press, UK, 113-118.

NARRATIVE

Present Research Activities

Develop and apply *in vitro* techniques using advanced analytical tools (e.g., NMR spectroscopy) and innovative approaches (e.g., chiral substrates and chemical docking simulation) to measure, understand and predict the kinetics and mechanisms of xenobiotic metabolism.

Improve the accuracy of *in vitro* metabolism measurements by understanding and correcting for nonspecific binding. Nonspecific binding can significantly bias kinetic measurements and is a serious barrier to reliably integrating kinetic data as evidenced by the large variability in published kinetic values for the same chemical. Integrate metabolism and metabonomics results to develop a holistic hypothesis based approach to understand toxic mode of action within and across species.

Application of inverse quantitative structure activity relationships (QSARs) to existing toxicity data to develop structural based descriptors. These descriptors are then used to improve existing QSARs that are based only upon physiochemical properties. This work is being conducted in conjunction with Sandia National Laboratories. Development of a structure searchable data base containing plant and animal metabolic maps for OPP to improve the efficiency and accuracy of risk assessments.

Future Research Activities

Inter- and intraspecies extrapolation using metabolism results from rat and trout hepatic microsomes, S9, and hepatocytes. Results will be used to further test and improve the metabolic simulator.

Integration of chemical docking, chiral probe molecules, inverse QSARs, and laboratory generated metabolism data to better understand and reliably predict metabolism based upon structural motifs and computational values.

High throughput toxicity screening of chemicals using whole organism (e.g., daphnia) NMR-based metabonomics. Preliminary work has already been conducted. Data will be compared to existing data collected from rats.

Past Research Activities

Abiotic mediated reductive transformation of halogenated organic compounds under environmentally relevant conditions. Developed QSARs and multivariate models using bond dissociation energies and the free energy of electron transfer to predict reductive transformations. Compiled a database of over 300 measured rate constants.

Abiotic and biotic transformation of the pesticide, fipronil, under sulfate and iron reducing conditions. Discovered new degradation products and delineated the role of abiotic and biotic processes in their formation.

Zero-valent iron mediated processes for the removal of halogenated organic solvents from water.

Determined that accounting for passivation of zero-valent iron as a result of corrosion is critical for the design of effective permeable reactive barriers. It was found that iron chelators could be used to restore and enhance the effectiveness of these barriers.

Titanium dioxide photocatalysis of halogenated organic solvents. Discovered new transformation products and reaction mechanisms. Employed photoelectrochemical techniques to discern the roles of semiconductor holes and electrons in substrate transformation and product formation. Received awards from the American Chemical Society/Lewis Publishers, Hoechst-Celanese, and the University of North Carolina for this work.

BIOGRAPHICAL SKETCH

NAME: Michael Kosusko

POSITION TITLE: Chemical Engineer

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Stevens Institute of Technology, Hoboken, NJ	B.E.	1977	Chemical Engineering
University of Virginia, Charlottesville, VA	M.S.	1980	Chemical Engineering
Duke University, Durham, NC	Certificate Program	2002	Nonprofit Management

PROFESSIONAL EXPERIENCE

1984 – Present Senior Project Engineer, US EPA, ORD, RTP, North Carolina.
2005 – Present Manager, ETV ESTE Pesticide Spray Drift Reducing Technology Project.
2004 – Present Manager, ETV Air Pollution Control Technology Center.
1996 – Present Manager, ETV P2 Coatings and Coating Equipment Pilot.
1983 – 1984 Process Engineer, Engelhard Corporation, McIntyre, Georgia.
1978 – 1983 Research Engineer/Project Leader, Engelhard Corporation, Edison, New Jersey.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Institute of Chemical Engineers Member (1979 to present)
Eastern North Carolina Section Secretary (1986 to 1987)
Treasurer (1987 to 1988)
Vice Chair (1988 to 1989)
Chair (1989 to 1990)
Air & Waste Management Association Member (1985 to present)
National Defense Industrial Association Member (2003 to present)
National Pollution Prevention Roundtable Member (1993 to present)
Sigma Xi
Tau Beta Pi

SELECTED AWARDS AND HONORS

EPA Bronze Medal for development of pollution prevention tools (Coatings Alternatives Guide) (2002)
EPA Bronze Medal for participation in the ETV Program (2001)
Semi-finalist, Innovations in American Government Award as part of ETV Program Team (2000)
National Performance Review Hammer Award (1998)

INVITED LECTURES/SYMPOSIA

Environmentally Technology Verification of High Transfer Efficiency Paint Spray Guns, Painting Technology Workshop, University of Kentucky, Lexington, KY, 9/28/2004.

Environmental Technology Verification of UV-curable and Other Liquid Coatings, Painting Technology Workshop, University of Kentucky, Lexington, KY, 10/1/2003.

Verification of Improved Paint Transfer Efficiency through the Use of High-Volume, Low-Pressure (HVLP) Spray Guns, Painting Technology Workshop, University of Kentucky, Lexington, KY, 6/25/2002.

Environmental Technology Verification To Reduce The Risk of Using Innovative Coating Technologies, Painting Technology Workshop, University of Kentucky, Lexington, KY, 6/5/2001.

The Coatings Guide™: An Online Information Resource, Painting Technology Workshop, University of Kentucky, Lexington, KY, 6/5/2001.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Organizing Committee, Painting Technology Workshop (2002 to Present)

Scientific Committee, International Symposia: Characterization and Control of Odours & VOC in the Process Industries [Louvain-la-Neuve, Belgium (1993); Paris, France (1994), Montreal, Canada (1997)]

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Management of the Pesticide Spray Drift Reducing Technology (DRT) project under the Environmental and Sustainable Technologies Evaluation program in support of the Environmental Technology Council's DRT Action Team. (2005 to present)

Several ORD and NRMRL strategic planning retreats (2003 to present)

Experiential Learning Facilitator for ORD (2003 to present)

PUBLICATIONS

Franke, D.L., A.R. Trenholm, and M. Kosusko, "Verification Testing of Technologies to Clean or Filter Ventilation Air," paper for AWMA/EPA Indoor Environmental Quality: Problems, Research, and Solutions, Durham, NC, 7/2006.

Kosusko, M., K. Bullock, N.B. Birchfield, and A.J. Hewitt, "Development of a Test Plan to Verify Pesticide Drift Reduction Technologies," presentation to the 2006 ASABE Annual International Meeting, Portland, OR, July 2006.

Elion, J.M., and M. Kosusko, "Environmental Technology Verification of Mobile Sources Control Technologies," poster for AWMA Diesel Exhaust: Partnering with Stakeholders to Reduce Emissions, Oak Brook, IL, October 2005.

Trenholm, A.R., and M. Kosusko, "Environmental Technology Verification of Emission Controls for Heavy-Duty Diesel Engines," paper for Proceedings A&WMA 98th Annual Conference, Indianapolis, IN, June 2005.

Elion, J.M., and M. Kosusko, "Environmental Technology Verification of Mobile Sources Control Technologies," presentation to 11th Diesel Engine Emissions Reduction (DEER) Conference, Chicago, IL, August 2005.

Kosusko, M., and R.J. Fisher, "Environmental Technology Verification of Coatings and Coating Equipment," presentation to National Environmental Assistance Summit, Baltimore, MD, April 2004.

Kosusko, M., "EPA's Program for Performance Verification of Innovative Coating Technologies," presentation to 14th Annual International Workshop in Alternatives to Toxic Materials in Industrial Processes, Scottsdale, AZ, December 2003.

Kosusko, M., "The Coatings Guide," presentation to 13th Annual International Workshop on Solvent Substitution and the Elimination of Toxic Substances & Emissions, Scottsdale, AZ, December 2002.

Napotnik, J.A., and M. Kosusko, "The ETV P2 Innovative Coatings and Coating Equipment Program – An Update," Proceedings A&WMA 95th Annual Conference, Baltimore, MD, June 2002.

Kosusko, M., "Encouraging the Use of New Technologies," *Industrial Paint and Powder*, 28-30, November 2001.

Kosusko, M., and C.H. Archibald, "The Coatings Guide™: An Online Information Resource," Proceedings A&WMA 94th Annual Conference, June 2001.

Kosusko, M., and C.H. Archibald, "The Coatings Guide: An Integrated Tool for Coatings Decisions," *Metal Finishing*, 99, 45-51, May 2001.

Kosusko, M., "Reducing the Risk of Using Innovative Coating Technologies," presentation Advanced Coatings Technology (ACT) 2000 Conference, Dearborn, MI, September 2000.

NARRATIVE

My current interests are all in support of EPA's Environmental Technology Verification Program. These include the verification of air pollution reduction technologies (e.g., heavy duty diesel retrofit control technologies, baghouse filtration materials, ventilation air cleaners, dust suppressants, alternative surface coatings and coating equipment, and pollution prevention) as well as pesticide spray drift reducing technologies.

BIOGRAPHICAL SKETCH

NAME: Ken Krebs

POSITION TITLE: Chemist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
North Carolina State University, Raleigh, North Carolina	B.S.	1988	Chemistry

PROFESSIONAL EXPERIENCE

1997-present: Environmental Scientist, EPA/ORD/NRMRL/APPCD Indoor Environment Management Branch, Research Triangle Park, NC

1985-97: Technician (1985)/Chemist (1988), Acurex Environmental Corp, Research Triangle Park, NC

1984-85: Chemist, Coal Gas Inc., Raleigh, NC

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Chemical Society

American Association for the Advancement of Science

PUBLICATIONS

Ken Krebs, and Nancy Roache "Effect of Sampling Location on Concentrations in Large Chamber Investigation of Emissions from Markers" Proceedings of the Engineering Solutions to Indoor Air Quality Problems Symposium, Pittsburgh, PA 2006; Air & Waste Management Association;

Liu, X., M. Mason, et al. (2003). "VOCs Emissions, Degradations, and Kinetic Simulations of Large Chamber Test on Indoor Air Fresheners." Environmental Science and Technology 38(10): 2802-2812.

Ken Krebs, Xiaoyu Liu, and Mark Mason "Air Fresheners as Indoor Sources" Proceedings of the Engineering Solutions to Indoor Air Quality Problems Symposium, Pittsburgh, PA 2003; Air & Waste Management Association;

Xiaoyu Liu, Mark Mason, Ken Krebs "Indoor Air Freshener Large Chamber Tests and Kinetic Simulations" Proceedings of the Engineering Solutions to Indoor Air Quality Problems Symposium, Pittsburgh, PA 2003; Air & Waste Management Association;

NARRATIVE

Mr. Krebs has 20-year experience in indoor air quality (IAQ) and exposure research and is specialized in source testing, sample collection, analytical chemistry, modeling, and IAQ simulation. He has been involved in testing various indoor pollution sources; among the sources were paints, carpets, furniture, office equipment, and emissions perfluorotelomer alcohols from popcorn bags.

BIOGRAPHICAL SKETCH

NAME: Anne Kuhn POSITION TITLE: Research Physical Scientist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Rhode Island	B.S.	1980	Biology
University of Rhode Island	M.S.	1988	Aquaculture
University of Rhode Island	Ph.D.	exp. 2007	Conservation Biology

PROFESSIONAL EXPERIENCE

1995-present Research Physical Scientist, Atlantic Ecology Division, National Health and Environmental Effect Research Laboratory, U.S. EPA, Narragansett, RI

1993-1995 Research Biologist/Work Assignment Manager Contaminated Sediments Program, Science Applications International Corporation (SAIC), Narragansett, RI

1990-1993 Lab Manager/Project Manager Environmental Testing Center, Science Applications International Corporation (SAIC), Narragansett, RI

1984-1990 Research Biologist/Work Assignment Manager Water Quality Criteria Program, Science Applications International Corporation (SAIC), Narragansett, RI

1982-1984 Marine Research Specialist, University of Rhode Island on location at U.S. EPA Environmental Research Laboratory, Narragansett, RI.

1981-1982 Aquacultural Specialist, Blue Gold Seafarms, Inc., Middletown, RI.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

International Association of Landscape Ecologists; Society for Conservation Biology, Wildlife Society; Ecological Society of America; North East Estuarine Research Society; Society of Environmental Toxicology and Chemistry; Estuarine Research Federation. Reviewer for Environmental Toxicology and Chemistry.

SELECTED AWARDS AND HONORS

EPA Scientific and Technical Advancement Award (STAA) for Publications, 1998, 1999, 2003, 2005
Citation from RI Governor for dedicated efforts- World Prodigy Oil Spill, 1989 (SAIC)
Special Act/ Service Award - S- Award (Superior Accomplishment Recognition) August, 2000 (U.S. EPA)
Special Accomplishment Recognition Award, 2004 (NCEA dermal study)

INVITED LECTURES/SYMPOSIA

Invited presenter. A Multi-scale Approach to Breeding Habitat Model Development and Evaluation for the Common Loon, *Gavia immer*, in New Hampshire, USA. Invited Oral presentation at the International Association of Landscape Ecologists Meeting in San Diego, CA, March 2006.

Invited seminar. Use of Models to Support Water Quality Criteria – A Case Study. European Science Foundation Scientific Programme 'EcolMAT' Workshop on Development of a Guideline to Select Applicable Mechanistic Models Aiming At Assessment of the Impact of Pollutants in Food-Chains. Prague, Czech Republic, 18 April 2004 (Co-author)

Invited presenter. A GIS-based Multi-Scale Approach to Habitat Model Development for the Common Loon, *Gavia*

immer. Invited Oral Presentation at Special Landscape Ecology and the EPA session at the International Association of Landscape Ecologists Las Vegas, Nevada, April 2004

Invited seminar. Population Risk Assessment: Extrapolating Risks from Toxicity Data. NHERRL-OERR seminar series, Washington, D.C. March 2003.

Invited presenter. Using models to extrapolate population-level effects from laboratory toxicity tests in support of population risk assessments. Interactive Poster Presentation for the Population Modeling in Ecological Risk Assessment session of the 23rd Annual Meeting of the Society of Environmental Toxicology and Chemistry, Salt Lake City, Utah. November, 2002

Invited presenter. Extrapolating Acute Mortality of *Ampelisca abdita* to Population Risk Using a Population Model and Monitoring Data. Invited Presentation. Oral Platform Presentation for the Population Modeling in Ecological Risk Assessment session of the 21st Annual Meeting of the Society of Environmental Toxicology and Chemistry, Nashville, TN. November, 2000.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Society of Environmental Chemistry and Toxicology, Symposium on Spatial Ecology in Ecological Risk Assessment, Chair 2006

NHEERL/Research Training Opportunity Program Geospatial Statistics Training Workshop, Co-Chair 2002

EPA STAR Cooperative Agreement #CR82-9085, "Evaluating the Impact of Multiple Stressors on Common Loon Population Demographics - An Integrated Laboratory and Field Approach", Research Scientist 2003 - present.

Lead role for collaborative research planning and implementation with NH Loon Preservation Committee (ongoing 2001-2006)

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Nacci, D, J. Grear, and A. Kuhn. 2005. Overview of U.S. Environmental Protection Agency National Health and Environmental Effects Research Laboratory research products to support Annual Performance Goal 30. Report to U.S. EPA Office of Water.

Grear, J., D. Nacci, A. Kuhn, S. Walters, and J. Copeland. 2005. Methods for developing water quality criteria based on population-level risks of multiple stressors to aquatic life and aquatic-dependent wildlife: Population modeling and analysis. Report to U.S. EPA Office of Water (APM 567).

Kuhn, A., J. Copeland, J. Grear, S. Walters, M. Nicholson, and D. Nacci. 2005. Report on habitat suitability indices to support population models for projecting relative risk of multiple stressors including toxic chemicals and habitat alteration to common loons. Report to U.S. EPA Office of Water (APM 558).

EPA Summer Internship Mentoring program (1995-present)

EPA/ NMES Mentorship program (1997-2000)

EPA/Morgan State University Summer Internship Program (1996-present)

EPA Student Volunteer Program (1999)

EPA Education Outreach Program (1994-present)

NHEERL Diversity Steering Committee, AED Representative Member, 2000-2003

Williamsburg Follow-On Action Team: Integrating Science with EPA Mission 1997-98

NHEERL Wildlife Eco-Risk Workgroup- contributing member 1999-present

NHEERL Sediment Effects Research Group (SERG) 1998-2002

NHEERL Toxicity Identification Evaluation (TIE) workgroup 1996-2002

NHEERL Diversity Action Group (DAG) 2000-2003

NHEERL Wildlife Risk Assessment Research Planning Workgroup 2000-present

NHEERL Aquatic Stressors Habitat Workgroup 2002-present

Leader of the Geospatial Modeling Team, developed detailed research plans for the Spatial Integration Research Area of the Loon/Hg Demonstration Project for the NHEERL Wildlife Risk Assessment Research Strategy 2000-present

Participated in ORD- Regional Workshop on Endocrine Disruptors by contributing and interpreting research findings

for OPPTS May, 2001.

PUBLICATIONS

- Nacci, D., Coiro, L., Kuhn, A., Champlin, D., Munns, W.R., Jr., Specker, J., and Cooper, K. 1998. A fish embryonic EROD bioassay. *Environmental Toxicology and Chemistry* 17(12): 2481-2486. EPA STAA III
- Kuhn, A., Munns, Jr., W.R., Lussier, S., Champlin, D. and S. Poucher. 2000. Prediction of population-level response from mysid toxicity test data using population modeling techniques. *Environmental Toxicology and Chemistry* 19: 2364-2371.
- K. T. Ho, A. Kuhn, M. Pelletier, F. Mc Gee, R. M. Burgess and J. Serbst. 2000. Sediment toxicity assessment: Comparison of standard and new testing designs. *Archives of Environmental Contamination and Toxicology* 39:462-468.
- Kuhn, A., Munns, Jr., W.R., Champlin, D., McKinney, R., Tagliabue, M., Serbst, J., and T. Gleason. 2001. Evaluation of the efficacy of extrapolation population modeling to predict the dynamics of *Americamysis bahia* populations in the laboratory. *Environmental Toxicology and Chemistry* 20: 213-221. . EPA STAA II
- Kuhn, A., W.R.Munns, Jr., J.R. Serbst, P.Edwards, M.G.Cantwell, T. Gleason, M. Pelletier, and W.Berry. 2002. Evaluating the ecological significance of laboratory response data to predict population-level effects for the estuarine amphipod *Ampelisca abdita* . *Environmental Toxicology and Chemistry* 21: 865-874.
- Nacci, D., Pelletier, M., Lake, J., Bennett, R., Nichols, J., Haebler, R., Grear, J., Kuhn, A., Copeland, J., Nicholson, M., Walters, S., and Munns, W.R., Jr. 2005. Predicting Wildlife Population Effects from Mercury and Other Stressors. *Ecotoxicology* 14(1 - 2): 283 - 293.
- Kuhn, A., Jane Copeland, Jason Grear, Steven Walters, Matthew Nicholson and Diane Nacci. 2005. Report on habitat suitability indices to support population models for projecting relative risk of multiple stressors including toxic chemicals and habitat alteration to Common Loons (*Gavia immer*). AED-05-118 of the U.S. EPA ORD NHEERL Atlantic Ecology Division.
- Nacci, D, J. Grear, and A. Kuhn. 2005. Overview of U.S. Environmental Protection Agency National Health and Environmental Effects Research Laboratory research products to support Annual Performance Goal 30. Report to U.S. EPA Office of Water.
- Grear, J., D. Nacci, A. Kuhn, S. Walters, and J. Copeland. 2005. Methods for developing water quality criteria based on population-level risks of multiple stressors to aquatic life and aquatic-dependent wildlife: Population modeling and analysis. Report to U.S. EPA Office of Water (APM 567).

BIOGRAPHICAL SKETCH

NAME: Susan Laessig

POSITION TITLE: Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Miami, Coral Gables, FL	B.S.	1992	Marine Science and Biology
University of Maryland, Baltimore, MD	M.S.	1996	Toxicology
University of Maryland, Baltimore, MD	Ph.D.	2000	Toxicology

PROFESSIONAL EXPERIENCE

June 2004- present: Toxicologist, U.S. Environmental Protection Agency, Washington, DC
January 2003-May 2004: Associate, Sciences International, Inc., Alexandria, VA
April 2001-December 2002: Postdoctoral Fellow, National Center for Toxicological Research, Oak Ridge Institute for Science and Education (ORISE)
Sep.-Dec. 2000: Visiting Scientist, Free University, Berlin, Germany
June-August 2000: Graduate Intern, National Academy of Sciences Internship Program

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Toxicology, National Capital Area Chapter
Teratology Society
Neurobehavioral Teratology Society
Phi Kappa Phi Honor Society

SELECTED AWARDS AND HONORS

2005 EPA Bronze Medal, ORD Biotechnology Research Program Steering Committee
2004 EPA Bronze Medal, Organizing Committee of the Scientific Program for the Endocrine Disruptors BOSC review
2001 Postdoctoral Fellowship- Oak Ridge Institute for Science and Education
1999-2000 Dissertation Fellowship- American Association of University Women

INVITED LECTURES/SYMPOSIA

Jun. 2002 "Pesticides, hormones, and the brain", EPA, Washington, DC
Dec. 2000 "Neurotoxicity of endocrine disruptors", University of Düsseldorf, Germany
Sep. 2000 "Neurotoxicity of endocrine disruptors", EPA, Research Triangle Park, NC
Sep. 2000 "Neurotoxicity of endocrine disruptors", University of North Carolina, Chapel Hill, NC

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Biotechnology Research Program Committee
Endocrine Disruptors Research Program Committee
Computational Toxicology Implementation Steering Committee
Workgroup for Plant-Incorporated Protectant (PIP) Producer Compliance Rules

PUBLICATIONS

Original articles

Laessig, S.A., J.A. Davis, Jr., and C.A. Kimmel. (in preparation). Pentachlorophenol: Comparison of animal and human reproductive and developmental toxicity. *Birth Defects Research (Part C)*.

- Laessig, S.A.**, A.P. Auger, M.M. McCarthy, and E.K. Silbergeld. (in press). Effects of prenatal chlordecone on sexually differentiated behavior in adult rats. *Neurotoxicol Teratol*.
- Laessig, S.A.**, Tabacova, S.A., and C.A. Kimmel. (2003). A review of reproductive and developmental effects of pesticide exposure in humans. *Journal of Children's Health*. 1(4):405-447.
- Laessig, S.A.**, McCarthy, M.M., and Silbergeld, E.K. (1999). Neurotoxicity of endocrine disruptors. *Current Opinion in Neurology*. 12:745-751.

Reports

National Research Council, Ocean Studies Board. "Recruiting fishery scientists: workshop on stock assessment and social science careers", National Academy Press, 2001.

Abstracts

- Davis Jr., J.A., **S.A Laessig**, and C.A. Kimmel (2006). Pentachlorophenol: Comparison of Animal and Human Reproductive and Developmental Toxicity, *Birth Defects Research Part A* 76(5):385.
- Laessig, S.A.**, Tabacova, S.A., and C.A. Kimmel (2002). Evaluation of human developmental toxicity following pesticide exposure. *The Toxicologist*. 66(1-S):153.
- Laessig, S.A.**, Auger, A.P., McCarthy, M.M., and Silbergeld, E.K. (2000). Persistent neurobehavioral effects in Sprague-Dawley rats following prenatal exposure to the environmental estrogen, chlordecone. *The Toxicologist*. 54(1):266.
- Laessig S.A.**, M.M. McCarthy, and E.K. Silbergeld (1999). Prenatal exposure to estrogenic endocrine disrupting chemicals (EDCs) affects sexual differentiation of the rat brain. *The Toxicologist*; 48:46.
- Laessig, S.A.**, Mong, J.A., Flaws, J.A., Hirshfield, A.N., Silbergeld, E.K., and McCarthy, M.M. (1997). Prenatal exposure to the chlorinated pesticide, Kepone, has estrogenic effects on open field behavior and SDN-POA volume in adult rats. *Society for Neuroscience Abstracts, 27th annual meeting*, 23 (2): 1936.
- Laessig, S.A.** and Place, A.R. (1996). Chronic reproductive effects are seen in *Daphnia magna* exposed to a non-steroidal aromatase inhibitor, CGS 16949A. *The Toxicologist*, 30 (1): part 2, p. 118.

NARRATIVE

Dr. Susan Laessig joined the EPA Office of Research and Development, National Center for Environmental Research in 2004 where she plans, coordinates, manages, and monitors extramural research programs in Biotechnology and Endocrine Disruptors. Dr. Laessig contributes to research program planning and review committees responsible for reviewing program goals, accomplishments, and future directions for these programs as well as the Computational Toxicology Program.

Dr. Laessig has extensive research experience in developmental and environmental toxicology and experience in biotechnology, neurotoxicology, ecotoxicology, risk assessment, and ecology. Her experiences prior to joining the Federal government include positions in academic research, environmental policy, and consulting, working both independently and as part of a team. At Sciences International, Inc. Dr. Laessig worked as an environmental health consultant in toxicology analyzing federal and state regulations and performing risk assessments and technical reviews. As a postdoctoral research fellow at the National Center for Toxicological Research (NCTR) Dr. Laessig assessed and developed methods to compare animal and human data for developmental toxicity risk assessment pertaining to pesticide exposure. Her doctoral research investigated the effects of hormones and environmental endocrine disrupting chemicals on brain development and sexual behavior in the rat.

BIOGRAPHICAL SKETCH

NAME: Christopher Lau

POSITION TITLE: Lead Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Duke University	A.B.	1975	Chemistry/Zoology
Duke University	Ph.D.	1982	Pharmacology

PROFESSIONAL EXPERIENCE

1982-1984: Research Associate, Dept. of Anatomy, Medical College of Pennsylvania, Philadelphia, PA
1984-1990: Research Scientist, NSI Technology Services, Environmental Sciences, Research Triangle Park, NC
1990-2005: Pharmacologist, Reproductive Toxicology Division, National Health and Environmental Effects Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC
2005-present: Lead Research Biologist, Reproductive Toxicology Division, National Health and Environmental Effects Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC
1984-present: Adjunct Assistant Professor, Department of Pharmacology and Cancer Biology, Duke University Medical Center, Durham, NC
2002-2004: Adjunct Assistant Professor, Department of Biology, North Carolina Central University, Durham, NC
2004-present: Adjunct Professor, Department of Molecular Biomedical Sciences, College of Veterinary Medicine, North Carolina State University, Raleigh, NC

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society for Neuroscience
Teratology Society
Society of Toxicology
International Society for Developmental Origins of Health and Disease
Editorial Board of *Reproductive Toxicology*
Editorial Board of *Toxicology*
Editorial Board of *Brain Research Bulletin*

SELECTED AWARDS AND HONORS

1983: Fellowship in Pharmacology-Morphology, Pharmaceutical Manufacturers Association Foundation
1994: Society of Toxicology, Best Paper Award in *Toxicology Applied Pharmacology*
1995: U.S. EPA ORD Scientific and Technological Achievement Award, Level I
2005: U.S. EPA OPPTS bronze medal for commendable service
2006: U.S. EPA ORD bronze medal for commendable service

INVITED LECTURES/SYMPOSIA

1995: Neurotoxicology Division, NHEERL, U.S. EPA, RTP, NC: *Developmental neurotoxicity of PCB.*
1996: Continuing Education Course, Teratology Society, Keystone, CO: *Biologically-based models.*
1999: Teratology Society Symposium, Keystone, CO: *5-FU, nucleotide pools and craniofacial/limb dysmorphogenesis.*
2000: Dept. Environmental Health Sciences, Univ. Washington, Seattle, WA: *Construction of biologically-based dose-response models.*
2002: Midwest Teratology Association, Kalamazoo, MI: *Functional toxicity of the developing heart.*
2002: Medical Department, 3M, St. Paul, MN: *Reproductive toxicity of perfluorooctane sulfonate.*
2002: Department of Toxicology, N.C. State University, Raleigh, NC: *Developmental toxicity of perfluorooctane sulfonate.*

- 2002: Neurotoxicology Division, NHEERL, U.S. EPA, RTP, NC: *Toxicity of perfluorinated organic chemicals.*
- 2002: RTI International, Research Triangle Park, NC: *Developmental toxicity of perfluorooctane sulfonate.*
- 2003: Integrated Toxicology Program, Duke University, Durham, NC: *Developmental toxicity of perfluorooctane sulfonate.*
- 2003: Region 5, U.S. EPA, Chicago, IL: *Perfluorooctane compounds in the environment: PFOS toxicity studies.*
- 2003: Mid-Atlantic Reproductive Toxicology Association, King of Prussia, PA: *Developmental toxicity of perfluoroalkyl acids and their derivatives.*
- 2005: Henry Stewart Course on Abnormal Development in Washington DC: *Embryonic and fetal origins of physiological disorders.*
- 2005: National Fish Forum, Baltimore, MD: *Developmental toxicity of PFOS and PFOA.*
- 2005: Integrated Toxicology Program, Duke University, Durham, NC: *Adverse outcomes for developmental exposure to perfluorooctanoic acid.*
- (International)
- 2002: Southampton Hospital, Southampton, UK: *Adverse developmental outcomes after prenatal exposure to chemicals: a study with PFOS.*
- 2003: International Society of Exposure Analysis, Stresa, Italy: *Maternal and developmental toxicity of perfluorooctane sulfonate in the rat.*
- 2005: 3rd International Congress on Developmental Origins of Health and Diseases, Toronto, Canada: *Altered physiological response in adult rats after in utero exposure to perfluorooctane sulfonate or atrazine.*
- 2006: TNO Centers for Food and Nutrition, Zeist, Netherlands: *Pathogenesis for the neonatal mortality in rodents induced by exposure to perfluoroalkyl acids during pregnancy.*

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

- 2004-present: Study design team at NTP in perfluoroalkyl acid research.
- 2006: Ad hoc reviewer for grant application at NIEHS.
- 2004-2005: International advisor to FLUOROS: an international symposium on fluorinated alkyl organics in the environment, held in Toronto, Canada.
- 2006-present: Primary organizer for the Contemporary Concept in Toxicology workshop on perfluoroalkyl acid research sponsored by Society of Toxicology.
- 2003-present: Continuing Education Committee of Teratology Society, serving as secretary from 2005-2006 and as chair from 2006-2007.
- 1984-present: Ad hoc reviewer for 30 scientific journals, serving on the editorial board for three of them (see above).
- 1992-1999: Review panel for grant application to the Center for Indoor Air Research
- 2000-present: Review panel for grant application to Philip Morris External Research Program
- 2002-present: Review panel for US-Israel Life Science Research
- 2002-present: Review panel for Kentucky Science and Engineering Foundation
- 2006: *Ad hoc* review for Pilot Project Grants for Marine and Freshwater Biomedical Sciences Center, Oregon State University

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

- 2001: Provided review for NCEA risk assessment on developmental toxicity of perchlorate.
- 2002: Provided review for OPPTS risk assessment of thiourea.
- 2003: Provided review for OPPTS IRIS assessment on developmental toxicity of perfluorooctane sulfonate.
- 2004: Provided review for OPPTS risk assessment on developmental toxicity of perfluorooctanoic acid.
- 2005: Provided review for OPPTS risk assessment on toxicity of perfluorooctanoic acid.
- 1999: Organized workshop at RTP, NC on biological dose-response modeling.
- 2000-present: Organized annual meeting with OPPTS, industry and academic scientists to advance and coordinate research on perfluorinated chemicals.
- 2004: Organized workshop at RTP, NC on trace analysis of perfluoroalkyl acids.
- 2006: Organized PFAA Days workshop at RTP to highlight perfluorinated chemical research at ORD

- 2002: Provided briefings on behalf of EPA at Centers for Disease Control and Prevention, Atlanta, GA on reproductive and developmental toxicity of perfluoroalkyl acids.
- 2003: Provided briefings at Office of Pesticides, Prevention and Toxic Substances, Washington, DC on reproductive and developmental toxicity of PFOS.
- 2003: Provided briefings at Midwestern Ecology Division of NHEERL, Duluth, MN on research activities at the health laboratories at NHEERL on perfluoroalkyl acids.
- 2003: Provided briefings at Region 5 on perfluorinated chemical research at ORD.
- 2004-present: Led PFAA team at NHEERL and prepared NHEERL and ORD MYIP for SP2 research.
- 2004: Participated and resented at ORD-sponsored Science forum.
- 2005: Participated and resented at ORD-sponsored Science forum.
- 2006: Participated and resented at ORD-sponsored Science forum.

PUBLICATIONS

Publications during past 5 years, selected from a total of 92:

- Lau, C., Narotsky, M.G., Lui, D., Best, D., Setzer, R.W., Mann, P.C., Wubah, J.A. and Knudsen, T.B. (2002) Exposure-disease-continuum for 2-chloro-2'-deoxyadenosine (2-CdA), a prototype teratogen. 2. Induction of lumbar hernia in the rat and species comparison for the teratogenic responses. *Teratology* 66: 6-18.
- Hu, W., Jones, P.D., Upham, B.L., Trosko, J.E., Lau, C. and Giesy, J.P. (2002) Inhibition of gap junctional intercellular communication by perfluorinated compounds in rat liver and dolphin kidney epithelial cell lines in vitro and Sprague-Dawley rats in vivo. *Toxicol Sci* 68: 429-436.
- Price, O.T., Lau, C. and Zucker, R.M. (2003) Evaluation of apoptosis in fetal rat limbs using confocal laser scanning microscopy and quantitative fluorescence techniques. *Cytometry*, 53A: 9-21.
- Rogers, E.H., Hunter, E.S., Rosen, M.B., Rogers, J.M., Lau, C., Hartig, P.C., Francis, B.M., and Chernoff, N. (2003) Lack of evidence for intergenerational reproductive effects due to prenatal and postnatal undernutrition in the female CD-1 mouse. *Reprod. Toxicol.*, 17: 519-525.
- Thibodeaux, J. R., Hanson, R.G, Rogers, J.M., Grey, B.E., Barbee, B.D., Richards, J.H., Butenhoff, J.L., Stevens, L.A. and Lau, C. (2003) Exposure to perfluorooctane sulfonate during pregnancy in rat and mouse. I. Maternal and prenatal evaluations. *Toxicol. Sci.* 74: 369-381.
- Lau, C., Thibodeaux, J.R., Hanson, R.G., Rogers, J.M., Grey, B.E., Stanton, M.E., Butenhoff, J.L. and Stevenson, L.A. (2003) Exposure to perfluorooctane sulfonate during pregnancy in rat and mouse. II. Postnatal evaluation. *Toxicol. Sci.* 74: 382-392.
- Grasty, R.C., Grey, B.E., Lau, C. and Rogers, J.M. (2004) Prenatal window of susceptibility to perfluorooctane sulfonate-induced neonatal mortality in the Sprague-Dawley rat. *Birth Defects Res. (Part B)* 68: 465-471.
- Lau, C., Butenhoff, J.L. and Rogers, J.M. (2004) The developmental toxicity of perfluoroalkyl acids and their derivatives. *Toxicol. Appl. Pharmacol.* 198: 231-241.
- Lau, C. and Rogers, J.M. (2004) Embryonic and fetal programming of physiological disorders in adulthood. *Birth Defects Res. (Part C)* 72: 300-312.
- Grasty, R.C., Bjork, J., Wallace, K. Lau, C. and Rogers, J.M. (2005) Effects of prenatal perfluorooctane sulfonate (PFOS) exposure on lung maturation in the perinatal rat. *Birth Defects Res. (Part B)*, 74: 405-416.
- Lau, C., Thibodeaux, J.R., Hanson, R.G., Narotsky, M.G., Rogers, J.M., Lindstrom, A.B. and Strynar, M.J. (2006) Effects of perfluorooctanoic acid exposure during pregnancy in the mouse. *Toxicol. Sci.* 90:510-518.
- Lau, C. and Seed, J. (2006) Perfluorooctanoic acid and its environmental risks. *Yearbook of Science and Technology, McGraw-Hill Encyclopedia of Science and Technology*, in press.
- Wolf, C. Thibodeaux, J., Das, K., Schmid, J., Fenton, S., White, S., Lau, C. and Abbott, B. (2006) Developmental toxicity of perfluorooctanoic acid (PFOA) after cross foster and restricted gestational exposure. *Toxicol. Sci.*, submitted.
- Martin, M.T., Breman, R., Hu, W., Ayanoglu, E., Lau, C., Ren, H. Wood, C.R., Corton, J.C., Kavlock, R.J. and Dix, D.J. (2006) Toxicogenomic study of triazole fungicides and perfluoroalkyl acids in rat livers accurately categorizes chemicals and identifies mechanisms of toxicity. *Toxicol. Sci.*, submitted.

NARRATIVE

My research activities in the past have focused on the evaluation of developmental toxicity, the cellular and molecular mechanisms underlying the adverse health outcomes, and modeling of the dose-response relationship using the mechanistically-based parameters.

BIOGRAPHICAL SKETCH

NAME: Gerald A. Leblanc

POSITION TITLE: Professor

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Massachusetts	B.S.	1975	Biology
Bridgewater State College	M.A.	1981	Biology
University of South Florida	Ph.D.	1986	Biology

PROFESSIONAL EXPERIENCE

1986-89 Post-doc training, Molecular Toxicology, Harvard Medical School
1989-present Assistant/Associate/Full Professor (Department Head, 2006-present, Director of the Environmental Program 1990-present; Assistant Director, NIEHS Training Grant in Biochemical and Environmental Toxicology, 2003-present; Director of Graduate Programs, 1998-2002; Assistant Department Head, 2000-2002.), Department of Environmental & Molecular Toxicology, North Carolina State University, Raleigh, North Carolina
1986-89 Research Fellow, Department of Biological Chemistry & Molecular Pharmacology and Dana-Farber Cancer Institute, Harvard Medical School, Boston, Massachusetts
1983-86 Research Associate, University of South Florida, Tampa, Florida
1980-83 Director of Aquatic Toxicology, EG&G Bionomics, Wareham, Massachusetts
1975-80 Aquatic Toxicologist, EG&G Bionomics, Wareham, Massachusetts

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

(Within last 3 years)

2003 Editorial Board, *Aquatic Toxicology*
2003 Guest Editor, *Marine Environmental Research*
2005 Chairman, National Advisory Council for Environmental Policy and Technology, EDMVAC (USEPA)

INVITED LECTURES/SYMPOSIA

(Within last 3 years)

2003 US Environmental Protection Agency, Research Triangle Park, NC
2003 US Environmental Protection Agency, Washington, DC
2003 US Environmental Protection Agency, Pensacola, FL
2004 Society of Toxicology (Symposium Co-chair), Baltimore, MD
2004 Society for Integrative and Comparative Biology: Ecophysiology and Conservation, New Orleans, LA
2004 Appalachian State University, Boone, NC
2004 University of Texas, El Paso
2004 Food and Drug Administration, Washington, DC
2005 Mount Olive College, Mount Olive, NC
2005 North Carolina Central University, Durham, NC
2005 Carolina Society of Environmental Toxicology and Chemistry (Keynote speaker), Raleigh, NC
2005 US Environmental Protection Agency, Research Triangle Park, NC

- 2005 Society of Environmental Toxicology and Chemistry, Baltimore, NC
- 2005 Harbor Branch Oceanographic Institute, Fort Pierce, FL
- 2005 US Environmental Protection Agency, Duluth, MN
- 2006 NIEHS, Research Triangle Park, NC

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

- 2003 Co-Chair, Endocrine Toxicology Section, PRIMO 12 International Meeting, St. Petersburg, FL
- 2003 Review Panel Member, Swiss National Science Foundation, National Research Program “Endocrine Disruptors: Relevance to Humans, Animals and Ecosystems”
- 2004 Co-Chair, Symposium, Steroid Inactivation: Alternative mechanism of endocrine toxicity. Society of Toxicology meeting, Baltimore, MD
- 2004 Program Review Panel Member, Centre for Ecology & Hydrology, Natural Environment Research Council, UK

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

- 2003 Member, EPA-FIFRA National Science Advisory Panel on the developmental toxicity of atrazine to frogs
- 2003 External Advisor, promotion committee, US Environmental Protection Agency
- 2006 External Advisor, promotion committee, US Environmental Protection Agency

PUBLICATIONS

(From list of 124)

Mu X. and LeBlanc G.A. 2004. Synergistic interaction of endocrine disrupting chemicals: Model development using an ecdysone receptor antagonist and a hormone synthesis inhibitor. *Environ. Toxicol. Chem.* 23:1085-1091.

Wolf C.J., LeBlanc G.A., and Gray, L.E. Jr. 2004. Interactive effects of vinclozolin and testosterone propionate on pregnancy and sexual differentiation of the male and female SD rat. *Toxicol. Sci.* 78:135-143.

Gooding M.P. and LeBlanc G.A. 2004. Seasonal variation in testosterone regulation in the eastern mud snail (*Ilyanassa obsoleta*). *Invert. Biol.* 123:237-243.

Mu, X. and LeBlanc G.A. 2004. Cross communication between signaling pathways: juvenoid hormones modulate ecdysteroid activity in a crustacean. *J. Exp. Zool.* 301A:793-801.

Thompson D.M., Young H.P., Edens F.W., Olmstead A.W., LeBlanc G.A., Hodgson E., and Roe R.M. 2004. Non-target toxicology of a new mosquito larvicide, trypsin modulating oostatic factor (TMOF). *Pest. Biochem. Physiol.*, 80:131-142.

Rider C.V., Gorr T.A., Olmstead A.W., Wasilak B.A., and LeBlanc G.A. 2005. Stress Signaling: Co-regulation of hemoglobin and male sex determination through a terpenoid signaling pathway in a crustacean. *J. Exp. Biol.* 208:15-23.

Janer G., Sternberg R.M., LeBlanc G.A., and Porte C. 2005. Testosterone conjugation activities in invertebrates: are they targets for endocrine disruptors? *Aquatic Toxicol.* 71:273-282.

Mu X., Rider C.V., Hwang G., Hoy H., and LeBlanc G.A. 2005. Covert signal disruption: anti-ecdysteroidal activity of bisphenol A involves cross-talk between signaling pathways. *Environ. Toxicol. Chem.*, 24:146-152.

Olmstead A.W. and LeBlanc G.A. 2005. Assessing toxicity of environmentally-relevant pollutant mixtures using a

heuristic model. *Integr. Environ. Assessm. Manag.*,1:114-122.

Janer G., LeBlanc G.A., and Porte C. 2005. Androgen metabolism in invertebrates and its modulation by xenoandrogens. *Ann. N.Y. Acad. Sci.* 1040:354-356.

LeBlanc G.A., Gooding M.P., and Sternberg, R.M. 2005. Testosterone-fatty acid esterification: A unique target for the endocrine toxicity of tributyltin to gastropods. *Integr. Comp. Biol.* 45:81-87.

Wang H.Y., Olmstead A.W., Li H., and LeBlanc G.A. 2005. The screening of chemicals for juvenoid-related endocrine activity using the water flea *Daphnia magna*. *Aquatic Toxicol.*, 74:193-204

Janer G., LeBlanc G.A. and Porte C. 2005. A comparative study on androgen metabolism in three invertebrate species. *Gen. Comp. Endocrin.*, 143:211-221.

Rider C.V. and LeBlanc G.A. 2005. An integrated addition and interaction model for assessing the toxicity of chemical mixtures. *Toxicol. Sci.*, 87:520-528.

Olmstead A.W. and LeBlanc G.A. 2005. Joint action of polycyclic aromatic hydrocarbons: predictive modeling of sublethal toxicity. *Aquatic Toxicol.*,75:253-262.

Gorr T.A., Rider C.V., Wang H.Y., Olmstead A.W. and LeBlanc G.A. 2006. A candidate juvenoid hormone receptor cis-element in the *Daphnia magna* hb2 hemoglobin gene promoter. *Molec. Cell. Endocrin.* 247:91-102.

Sternberg R.M. and LeBlanc G.A. 2006. Kinetic characterization of the inhibition of acyl coenzyme A:steroid acyltransferases (ASATs) by tributyltin in the eastern mud snail (*Ilyanassa obsoleta*). *Aquatic Toxicol.* 78:233-242.

Rider C.V. and LeBlanc G.A. 2006. Atrazine stimulates hemoglobin accumulation in *Daphnia magna*: Is it hormonal or hypoxic? *Toxicol. Sci.* 93:443-449.

LeBlanc G.A. 2006. Crustacean endocrine toxicology: a review. In press, *Ecotoxicol.*

Wang Y.H., Wang G., and LeBlanc G.A. 2006. Cloning and characterization of the retinoid X receptor from a primitive crustacean *Daphnia magna*. In press, *Gen. Comp. Endocrin.*

BIOGRAPHICAL SKETCH

NAME: E. Henry Lee

POSITION TITLE: Statistician (Biology)

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Univ. of Manitoba, Winnipeg, Manitoba	B.Sc.	1976	Statistics
Univ. of Manitoba, Winnipeg, Manitoba	M.Sc.	1977	Statistics
Iowa State University, Ames, IA	Ph.D.	1981	Statistics

PROFESSIONAL EXPERIENCE

2004-Present: Affiliate Faculty, Assistant Professor, Department of Statistics, Oregon State University
1990-2004: Courtesy Faculty, Assistant Professor, Department of Statistics, Oregon State University
1985-1997: Biostatistician, Dynamac International, Inc (1996-1997); Mantech Environmental Research Services Corporation (1989-1996); NSI Technology Services Corporation - Environmental Services (1985-1989), Corvallis, OR
1981-1985: Assistant Professor, Department of Mathematical Sciences, Montana State University
1977-1981: Research Assistant, Statistical Laboratory. Iowa State University

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Statistical Association
President, Oregon Chapter of the American Statistical Association, 1996-1997
Vice-President, Oregon Chapter of the American Statistical Association, 1995-1996
Secretary-Treasurer, Oregon Chapter of the American Statistical Association, 1994-1995
President, Mu Sigma Rho, Iowa State University Chapter, 1980

SELECTED AWARDS AND HONORS

US EPA Scientific and Technological Achievement Award: Level I, 2005
US EPA National Honor Award: Gold Medal for Exceptional Service, Gene Flow Project Research Team, 2005
US EPA National Honor Award: Bronze Medal for Commendable Service, Ozone Research Team, 2003

PUBLICATIONS

- Lee, E.H., D.T. Tingey, P.A. Beedlow, M.G. Johnson, C.A. Burdick. (2006) Modelling fine root biomass of a mixed conifer stand in the Pacific Northwest. Submitted to Can. J. For. Res.
- Lee, E.H., D.T. Tingey, P.A. Beedlow, M.G. Johnson, C.A. Burdick. (2006) Relating fine root biomass to soil and climate conditions in the Pacific Northwest. Submitted to Forest Ecology and Management.
- Tingey, D.T., D. Phillips, E.H. Lee, R. Waschmann, D.M. Olszyk, P.T. Rygielwicz, M.G. Johnson. (2006) Elevated temperature, soil moisture and seasonality but not CO₂ affect canopy assimilation and system respiration in seedling Douglas-fir ecosystems. Submitted to Agricultural and Forest Meteorology.
- Beedlow, P.A., D.T. Tingey, D.L. Phillips, C.P. Andersen, R.S. Waschmann, M.G. Johnson, E.H. Lee. (2006). Sapwood moisture in Douglas-fir boles and seasonal changes in soil water. Submitted to Can. J. For. Res.
- Tingey, D.T., E.H. Lee, J.D. Lewis, M.G. Johnson, P.T. Rygielwicz. (2006). Do mesocosms influence photosynthesis and soil respiration? Submitted to Environmental and Experimental Botany.

- Tingey, D.T., M.G. Johnson, E.H. Lee, C. Wise, R. Waschmann, D.M. Olszyk, and L. S. Watrud. (2006) Effects of elevated CO₂ and O₃ on soil respiration under ponderosa pine. *Soil Biology & Biochemistry* 38, 1764-1778.
- Tingey, D.T., E.H. Lee, R. Waschmann, M.G. Johnson, and P.T. Rygielwicz. (2006) Does soil CO₂ efflux acclimatize to elevated temperature and CO₂ during long-term treatment of Douglas-fir seedlings? *New Phytologist* 170, 107-118.
- Reichmann, J.R., L. S. Watrud, E.H. Lee, C. Burdick, M. Bollman, M.J. Storm, G.A. King, C. Mallory-Smith. (2006) Establishment of transgenic herbicide-resistant creeping bentgrass (*Agrostis stolonifera* L.) in non-agronomic habitats. *Molecular Ecology*, doi: 10.1111/j.1365-294X.2006.03072.x.
- Van de Water, P.K., L.S. Watrud, E.H. Lee, C. Burdick, G. King. (2006). Characterization of long-distance GM pollen movement of creeping bentgrass (*Agrostis Stolonifera*) using modeled wind trajectory analysis. *Accepted Ecological Applications*.
- Olszyk, D.M., D.T. Tingey, W.E. Hogsett, E.H. Lee. (2005). Carbon dioxide and ozone affect needle nitrogen and abscission in *Pinus ponderosa*. In K. Omasa, I. Nouchi, and L.J. De Kok (eds.) *Plant Responses to Air Pollution and Global Change*, pp.101-109. Springer-Verlag, Tokyo.
- Lee, E.H., C.A. Burdick, D.M. Olszyk. (2005) GIS-based risk assessment of pesticide drift case study: Fresno County, California. U.S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Corvallis, OR. EPA Report No. EPA/600/R-05/029.
- Watrud, L.S., E.H. Lee, A. Fairbrother, C. Burdick, J.R. Reichman, M. Bollman, M. Storm, G. King and P.K. Van deWater. 2004. Evidence for landscape-level, pollen-mediated gene flow from genetically modified creeping bentgrass with CP4 EPSPS as a marker. *Proceedings of the National Academy of Sciences* 101(40):14533-14538.
- Tingey, D.T., W.E. Hogsett, E.H. Lee, and J.A. Laurence. (2004). Stricter ozone ambient air quality standard has beneficial effect on ponderosa pine in California. *Environ. Mgt.* 34, 397-405.
- Lee, E.H., D.T. Tingey, P.A. Beedlow, M.G. Johnson, and R.B. McKane. 2004. A spatial analysis of fine-root biomass from stand data in the Pacific Northwest. *Can. J. For. Res.* 34: 2169-2180.
- Lee, E.H., D.T. Tingey, W.E. Hogsett, and J.A. Laurence. 2003. History of tropospheric ozone for the San Bernardino Mountains of Southern California 1963-1999. *Atmospheric Environment* 37:2705-2717.
- Lee, E.H. and W.E. Hogsett. 2001. Interpolation of temperature and non-urban ozone exposure at high spatial resolution over the western United States. *Climate Research* 18:163-179.
- Neufeld, H.S., E.H. Lee, J.R. Renfro, and W.D. Hacker. 2000. Seedling insensitivity to ozone for three conifer species native to Great Smoky Mountains National Park. *Environmental Pollution* 108:141-151.
- Lee, E.H., and W.E. Hogsett. 1999. Role of concentration and time of day in developing ozone exposure indices used in modeling crop loss. *J. of Air & Waste Management Association* 49:669-681.
- Neufeld, H.S., E.H. Lee, J.R. Renfro, and W.D. Hacker. Insensitivity of seedlings of several conifer species to ozone in Great Smoky Mountains National Park. *Environmental Pollution* (in press).
- Hogsett, W.E., J.E. Weber, D. Tingey, A. Herstrom, E.H. Lee, and J.A. Laurence. 1997. An approach for characterizing tropospheric ozone risk to forests. *Environmental Management.* 21:105-120.
- Lee, E.H., W.E. Hogsett, and D.T. Tingey. 1994. Attainment and effects issues regarding the secondary ozone air quality standard. *J. of Environmental Quality.* 23:1129-1140.

Lee, E.H., D.T. Tingey, and W.E. Hogsett. 1988. Evaluation of ozone exposure indices in exposure-response modeling. *J. Environ. Pollut.*, 53:43-62.

U.S. Environmental Protection Agency. 1996. Air Quality Criteria for Ozone and Other Photochemical Oxidants. Chapter 5. Environmental Effects of Ozone and Related Photochemical Oxidants. Co-authored Section 5.5 of Document with Dr. Allen S. Lefohn. Research Triangle Park, NC: National Center for Environmental Assessment, Office of Research and Development; report no. EPA/600/P-93/004bF. Available from: NTIS, Springfield, VA; PB96-185590INZ.

Hogsett, W.E., A.A. Herstrom, J.A. Laurence, E.H. Lee, J.W. Weber, and D.T. Tingey. 1995. Risk characterization of tropospheric ozone to forests. Pages 119-145 in S.D. Lee and T. Scheider, editors, Comparative Risk Analysis and Priority Setting for Air Pollution Issues. proceedings of the 4th U.S.-Dutch international symposium: June 1993; Keystone, CO. Air & Waste Management Association publication VIP-43, Pittsburgh.

Lee, E.H., W.E. Hogsett, and D.T. Tingey. 1994. Alternative attainment criteria for a secondary federal standard for ozone. Pages 549-584 in J.O. Nriagu, and M.S. Simmons, editors, Environmental Oxidants. Advances in Environmental Sciences and Technology Series, v. 28, John Wiley & Sons, New York.

Tingey, D.T., W.E. Hogsett, and E.H. Lee. 1993. Effects of ozone on crops. Pages 175-206 in D.J. McKee, editor, Tropospheric Ozone: Human Health and Agricultural Impacts. Lewis Publishers, Boca Raton, FL.

Hogsett, W.E., D.T. Tingey, and E.H. Lee. 1988. Ozone exposure indices: concepts for development and evaluation of their use. Pages 107-138 in W.W. Heck, O. C. Taylor, and D.T. Tingey, editors, Assessment of Crop Loss from Air Pollutants; Proceedings of an International Conference; October 1987; Raleigh, NC. Elsevier Applied Science; New York.

BIOGRAPHICAL SKETCH

NAME: E. E. Laurence Libelo POSITION TITLE: Environmental Engineer

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Maryland	B.S.	1981	Geology
Virginia Polytechnic Institute and State University, Blacksburg, Virginia	M.S.	1988	Environmental Science and Engineering
College of William and Mary in Virginia	Ph.D.	1995	Marine Science

PROFESSIONAL EXPERIENCE

Senior Environmental Engineer, May, 2002 to present. U.S. Environmental Protection Agency, Office of Prevention, Pesticides and Toxic Substances, Environmental Exposure Branch

Adjunct Faculty, 2001- present. George Washington University, Depts of Chemistry and Exercise Science

Environmental Engineer, October 1997 to May, 2002. U.S. Environmental Protection Agency, Office of Pesticides Programs, Environmental Fate and Effects Branch

Civil Engineer, December 1994 to September, 1997. U.S. Air Force Armstrong Laboratory, Environmental Chemical Processes Group

Graduate Research Assistant, 1988 to 1994. Virginia Institute of Marine Science, School of Marine Science, College of William and Mary

U. S. National Science Foundation Summer Institute Fellow, 1991. Geological Survey of Japan, Environmental Geology Division

Graduate Research Assistant, 1987 to 1988. Department of Civil Engineering, Virginia Polytechnic Institute and State University

Staff Scientist, 1985 to 1986. Environment and Materials Division, DHR, Incorporated, McLean, Virginia

Geologist, 1982 to 1984. United States Geological Survey, Branch of Experimental Geochemistry and Mineralogy/Branch of Mineral Resources

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Chemical Society

American Geophysical Union

Geological Society of Washington

Society of Environmental Toxicology and Chemistry

American Association for the Advancement of Science

SELECTED AWARDS AND HONORS

American Society of Military Engineers, Cummings Award, 2006
U.S. EPA Bronze Medals, 2005, 2006
U.S. EPA OPPTS, OPPT Mission Award, 2004
U.S. EPA OPP, Honor Awards for Scientific Excellence, 2001, 2002
U.S. EPA OPP, Honor Award for Excellence in Teamwork, 2000, 2001
U.S. NOAA 1st Annual Award for Excellence in Coastal, Marine and Estuarine Graduate Study, 1992
U.S. National Science Foundation Fellowship for Japanese Language Study, 1989 to 1991
U.S. National Science Foundation Summer Institute in Japan Fellowship, 1991

SELECTED PUBLICATIONS

U.S. Environmental Protection Agency, 2006. Nanotechnology White Paper, EPA 100/B-06/001

Bugna, G. C., J.P. Chanton, T.B. Stauffer, W.G. MacIntyre, and E.L. Libelo, 2005. Partitioning microbial respiration between jet fuel and native organic matter in an organic-rich long time-contaminated aquifer. *Chemosphere*. Vol 60:177-187

OECD, 2004. Guidance Document on the Use of Multimedia Models for Estimating Overall Environmental Persistence and Long Range Transport. Series on Testing and Assessment No. 45. ENV/JM/MONO(2004)5. Paris

Bugna, B. C., J. P. Chanton, C. A. Kelley, T. B. Stauffer, W.G. MacIntyre, and E. L. Libelo. 2004 "A Field Test of 13 C as a Tracer of Aerobic Hydrocarbon Degradation. *Organic Geochemistry*. Vol 35:123-135

EPA, 2000. Interim Reregistration Eligibility Decision (IREED): Oxamyl. EPA 738-R-00-015. 156 pp.

Raymond D. Stapleton, Gary S. Saylor, J. Mark Boggs, E. Laurence Libelo, Thomas Stauffer and William G. MacIntyre, 2000. Changes in Subsurface Catabolic Gene Frequencies during Natural Attenuation of Petroleum Hydrocarbons. *Environ. Sci. Technol.* 34:1991-1999.

Lee, Richard, E. Laurence Libelo, and Thomas Steeger, 2000. Environmental Fate and Ecological Risk Assessment: Ecolyst (Diethyl-2(4-methylbenzyloxy)ethylamine hydrochloride). EPA/EFED Document.

Libelo, E. Laurence, Larry Liu, Ronald Parker, Dana Spatz and Thomas M. Steeger, 2000. Environmental Fate and Ecological Risk Assessment for the Registration of 2-[2,4-Dichloro-5-(prop-2-ynyloxy)-phenyl]-5,6,7,8-tetrahydro-2H-[1,2,4]triazolo[4,3-a]pyridin-3-one (azafenidin®). EPA Document.

EPA, 1998. Reregistration Eligibility Decision (RED): Alachlor. EPA 738-R-98-020. 338 pp

Libelo, E. Laurence, Thomas B. Stauffer, Timothy Shelley, Christopher A. Antworth, William G. MacIntyre and Glynnis Bugna. 1998. "Processes Contributing to Natural Attenuation of Fuel Hydrocarbons in Groundwater: A Field Study with Known Initial Conditions". pp 221-227. *Groundwater Quality: Remediation and Protection*. IAHS Publ. No 250. International Association of Hydrological Sciences Press. Oxfordshire, U.K.

Stauffer, T.B., E. L. Libelo, W. G. MacIntyre, J.M. Boggs and R. Stapleton. 1998. "A Field Study to Quantitate Important Chemical and Biological Processes in Natural Attenuation". Pp 95-100. *Proceedings of the 6th Int. FZK/TNO Conference*. CoSoil '98. Telford Publishing. Edinburgh, Scotland.

Levine, A.D., E. L. Libelo, G. Bugna, T. Shelley, H. Mayfield and T.B. Stauffer. 1997. "Biogeochemical Assessment of Natural Attenuation of JP-4-Contaminated Ground Water in the Presence of Fluorinated Surfactants". *The Science*

of the Total Environment. Vol. 208:179-195.

Libelo, E. Laurence, Thomas B. Stauffer, Michael A. Geer, William G. MacIntyre and J. Mark Boggs. 1997. "A Field Study to Elucidate Processes Involved in Natural Attenuation" in B.C. Alleman and A. Leeson Eds. In Situ and On-Site Bioremediation: Vol. 1. pp 23-28. Battelle Press, Columbus OH

Schwarzschild, Arthur C., William G. MacIntyre, Kenneth A. Moore and E. Laurence Libelo. 1994. "The Effects of Atrazine Contaminated Groundwater Discharge on *Zostera marina*". Journal of Experimental Marine Biology and Ecology. Vol. 183(1):77-89.

Libelo, E. Laurence and William G. MacIntyre. 1994. "Effect of Surface Water Movement on Seepage Meter Measurements". Applied Hydrogeology. Vol. 2(4):49-54.

Libelo, E. Laurence, William G. MacIntyre, Rochelle Seitz and Louis F. Libelo. 1994. "Transport of Water Across the Sediment-Water Interface By Passive Ventilation of Relic Biological Structures". Marine Geology. Vol. 120(1/2):1-12.

PATENTS:

U. S. Patent Number 4,757,172, Palaith, David E., and E. Laurence Libelo, Method and Apparatus for the Microwave Joining of Nonoxide Ceramic Items, Issued July 12, 1988. Canadian, European and Japanese patents issued.

U. S. Patent Number 4,767,902, Palaith, David E., and E. Laurence Libelo, Method and Apparatus for the Microwave Joining of Ceramic Items, Issued August 30, 1988. Canadian, European and Japanese patents

E. Laurence Libelo, Method and Apparatus for Sampling Chemicals in Groundwater, U.S. Patent Application filed May 31, 1991.

Antworth Christopher P. and E. Laurence Libelo, Passive Ventilation for Soil and Bioventing of Hydrocarbon Contamination. Patent Disclosure Submitted August, 1995.

E. Laurence Libelo, Device and Method for Monitoring Dissolved Hydrogen and Redox Conditions in Groundwater. U.S.A.F. Patent Disclosure submitted 1997.

BIOGRAPHICAL SKETCH

NAME: Andrew B. Lindstrom

POSITION TITLE: Research Physical Scientist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Winona State University	B.S.	1983	Biology
Wright State University	M.S.	1986	Biological Sciences
University of North Carolina at Chapel Hill	Ph.D.	1999	Environmental Health Sciences

PROFESSIONAL EXPERIENCE

1990 – Present, Environmental Scientist with the United States Environmental Protection Agency's (USEPA) National Exposure Research Laboratory, Research Triangle Park, North Carolina. Areas of expertise include protein adducts as indicators of exposure to carcinogens, analysis of exhaled alveolar breath to determine exposure and dose of volatile organic compounds (VOCs), and measurement of persistent perfluorinated organic compounds. Considerable experience with gas chromatography/mass spectrometry (GC/MS) and liquid chromatography/mass spectrometry (LC/MS) analysis to measure trace level contaminants in biological matrices and environmental media. Current research activities involve methods development for the detection of persistent perfluorinated organic compounds (PFCs) in biological and environmental media.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Appointed to the Board of the International Association of Breath Research, Vienna, Austria, May, 2005.

Member, Asahi Glass Foundation, Blue Planet Prize Nomination Committee, 2005 – present

SELECTED AWARDS AND HONORS

ORD Honor Award, Perfluorinated Chemical Research Team, for providing insights into the developmental toxicity of Perfluorooctane Sulfonate and Perfluorooctanoic Acid, thereby lending critical support to their human health risk assessment, September 28, 2006.

INVITED LECTURES/SYMPOSIA (Selected)

A.B. Lindstrom and M. Strynar, Perfluorinated Organic Compound Exposure Assessment Research, Invited lecture, International Conference on Environmental and Genetical Damage, November 3 - 6, 2005, Chongqing, China.

A.B. Lindstrom and M. Strynar, Perfluorinated Organic Compound Exposure Assessment Research, Invited lecture, National Institute of Environmental Studies, Tsukuba, Japan, October 31, 2005.

A.B. Lindstrom, Recent Developments in Exhaled Breath Analysis and Human Exposure Assessment Research, Invited Lecture, at Breath Analysis for Medical Diagnosis and Therapeutic Monitoring, May 26- 28, Innsbruck, Austria, May 26 -28, 2005.

A.B. Lindstrom and M. Strynar, Persistent Perfluorinated Organic Compounds Method Development Research at the U.S. Environmental Protection Agency, Invited Lecture, Center for Marine Environmental Studies Ehime University, Matsuyama, Japan, January 11, 2005.

A.B. Lindstrom and M. Strynar, Persistent Perfluorinated Compounds in the Environment: a Brief Introduction to this Important New Class of Pollutants, Invited lecture, National Cancer Center, Research Center for Cancer Prevention and Screening, Epidemiology and Prevention Division, 5-1-1 Tsukiji, Chuo-ku, Tokyo 104-0045, Japan, December 21, 2004

A.B. Lindstrom and M. Strynar, Persistent Perfluorinated Compounds in the Environment: a New Challenge for the U.S. Environmental Protection Agency, Tokyo American Center, Embassy of the United States, Tokyo, Japan, December 2, 2004.

A.B. Lindstrom and M. Strynar, Overview of Perfluorinated Compound Research at the U.S. Environmental Protection Agency's NERL/MDAB, Invited Lecture, Kyoto University Graduate School of Medicine, Department of Health and Environmental Sciences, November 17, 2004.

A.B. Lindstrom, Exhaled breath analysis for human exposure research, Invited Lecture, Breath Gas Analysis for Medical Diagnostics, Vorarlberg University of Applied Sciences, Dornbirn, Austria September 23-26, 2004.

A.B. Lindstrom and J.D. Pleil, Alveolar breath sampling and analysis in human exposure assessment studies, Department of Anaesthesia and Intensive Care Medicine, University Hospital of Rostock, Schillingallee 35, 18057 Rostock, Germany, September 25, 2001.

A.B. Lindstrom and J.D. Pleil, Alveolar breath sampling and analysis in human exposure assessment studies Lecture, NATO Advanced Study Institute Conference Disease Markers in Exhaled Breath: Basic Mechanisms and Applications, Crete, Greece, June 22 - July 1, 2001.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Science Fellow, United States Department of State, American Embassy, Tokyo, Japan, October 2004 – January 2005. Worked in the Environment Science and Technology section on matters related to the Montreal Protocol, persistent organic pollutants, and chemical regulations in Japan. Toured Japan's top research centers engaged in persistent perfluorinated compounds research and made seven different invited lectures.

Member of the International Life Sciences Institute (ILSI) Health and Environmental Sciences Institute (HESI) Biomonitoring Technical Committee (2003- present).

Member of the European Respiratory Society Task Force on Exhaled Biomarkers. Initial meeting at the European Respiratory Society Congress in Berlin, Germany, September 22 -26, 2001.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Critical assistance in the ORD risk assessment process for PFOA and other PFCs.

Conducted two Regional Applied Research Effort (RARE) projects with different EPA Regional Offices to investigate indoor air pollution control strategies.

PUBLICATIONS (Selected)

C. Lau, J.R. Thibodeaux, R.G. Hanson, M.G. Narotsky, J.M. Rogers, **A.B. Lindstrom**, and M.J. Strynar (2006) Effects of perfluorooctanoic acid exposure during pregnancy in the mouse. *Toxicological Sciences*, 90(2):510-519.

A.P. Henderson, C. Bleasdale, K. Delany, **A.B. Lindstrom**, S.M. Rappaport, S. Waidyanatha, W.P. Watson and B.T. Golding (2005), Evidence for the formation of Michael adducts from reactions of (*E,E*)-muconaldehyde with glutathione and other thiols. *Bioorg Chem.* 33(5):363-373.

A.B. Lindstrom, Recent Developments in Exhaled Breath Analysis and Human Exposure Research, Book Chapter in “Breath Analysis for Medical Diagnosis and Therapeutic Monitoring” edited by Anton Amann and David Smith, World Scientific (Singapore), May 2005.

M.A. Troester, **A.B. Lindstrom**, S. Waidyanatha, L.L. Kupper, and S.M. Rappaport (2002) Stability of hemoglobin and albumin adducts of naphthalene oxide, 1,2-naphthoquinone, and 1,4-naphthoquinone. *Toxicological Sciences*, 68 (2): 314-321.

A.B. Lindstrom and J.D. Pleil (2002) A review of the USEPAs single breath canister (SBC) method for exhaled volatile organic biomarkers. Invited manuscript, *Biomarkers*, 7 (3):189-208.

A.B. Lindstrom and J.D. Pleil, Volatile organic compounds as exposure biomarkers (2002) Book Chapter in "Disease Markers in Exhaled Breath; IOS Press, Amsterdam, Berlin, Oxford, Tokyo, Washington, DC; editors: N. Marczin & M.H. Yacoub; (first edition, September 25, 2002).

A.B. Lindstrom, K. Yeowell-O'Connell, S. Waidyanatha, T.A. McDonald, and S.M. Rappaport (1999) Investigation of benzene oxide in bone marrow and other tissues of F344 rats following metabolism of benzene *in vitro* and *in vivo*, *Chemico-Biological Interactions*, (122): 41-58.

A.B. Lindstrom, K. Yeowell-O'Connell, S. Waidyanatha, T.A. McDonald, B.T. Golding, and S.M. Rappaport (1998) Formation of hemoglobin and albumin adducts of benzene oxide in mouse, rat, and human blood. *Chemical Research in Toxicology*, 11(4): 302-310.

A.B. Lindstrom, J.D. Pleil, and D.C. Berkoff (1997) Alveolar breath sampling and analysis to assess trihalomethane exposures during competitive swimming training. *Environmental Health Perspectives*, 105(6): 636-642.

BIOGRAPHICAL SKETCH

NAME: Xiaoyu Liu

POSITION TITLE: EPA Postdoctoral Fellow

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Hunan Normal University	B.S.	1990	Chemistry
Beijing Normal University	MS.	1993	Analytical Chemistry
University of North Carolina, Chapel Hill	Ph.D.	1999	Environmental Science

PROFESSIONAL EXPERIENCE

2006.9 – present Postdoctoral Fellow, EPA/ORD/NRMRL, Research Triangle Park, NC

1999. 8 – 2006. 8 Project Scientist, ARCADIS, Research Triangle Park, North Carolina

1995. 8 – 1999. 7 Research Assistant and Postdoctoral Research Associate

Department of Environmental Science and Engineering, School of Public Health,
University of North Carolina at Chapel Hill, Chapel Hill, NC

1993. 8 – 1994. 2 Sales Manager, Hunan Chemicals Import & Export Corporation, Changsha, Hunan, People's Republic of China

1990. 9 – 1993. 7 Research and Teaching Assistant, Department of Chemistry, Beijing Normal University, Beijing, People's Republic of China

1986. 9 – 1990. 7 Research Assistant, Chemistry Department, Hunan Normal University, Changsha, Hunan, People's Republic of China

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Membership of Air & Waste Management Association since 1999

INVITED LECTURES/SYMPOSIA

Liu, X., Guo, Z., Sparks, L., Roache, N. Measurement of VOCs Desorbed from Building Materials – A High Temperature Dynamic Chamber Method, Indoor Environmental Quality (IEQ) - Problems, Research, and Solutions, International Specialty Conference, July 17-19, 2006 in Research Triangle Park, North Carolina, USA

Liu, X., Mason, M., Krebs, K., Sparks, L. VOC Emissions from an Air Freshener in the Indoor Environment, Engineering Solutions to Indoor Air Quality Problems International Symposium, Raleigh, North Carolina, USA, July 21-23, 2003.

PUBLICATIONS

Liu, X., Mason, M., Krebs, K., Sparks, L. VOC Emissions, Full-scale Chamber Investigation and Simulation of Air Freshener Emissions in the Presence of Ozone, Environ. Sci. & Tech., 2004, 38, 2802.

Henschel, B. D., Fortmann, R. C., Roache, N. F., Liu, X. Potential for Reducing Indoor Styrene Exposure from Copied Paper through Use of Low-Emitting Toners, J. Air & Waste Manage. Assoc. 2003, 53, 1347.

Henschel, B. D., Fortmann, R. C., Roache, N. F., Liu, X. Variations in the Emissions of Volatile Organic Compounds from the Toner for a Specific Photocopier, J. Air & Waste Manage. Assoc. 2001, 51, 708.

Liu X., Jeffries H.E., Sexton K.G., Atmospheric Photochemical Degradation of 1,4-Unsaturated Dicarboxyls. In

Proceedings Sixth US/Germany Workshop on Ozone/Fine Particle Science. Dimitriades B. (ed.), U. S. Environmental Protection Agency, 2000, 272-302.

Liu, X., Jeffries, H. E., Sexton, K. G., Study of 1,4-Unsaturated Dicarboxyls in the Atmospheric Photochemical Degradation Process, Environ. Sci. & Tech. 1999, 33(23), 4212.

Liu, X., Jeffries, H. E., Sexton, K. G., Hydroxy Radical and Ozone Initiated Photochemical Reactions of 1, 3-Butadiene, Atmospheric Environment, 1999, 33, 3005.

Liu X., Jeffries H.E., Sexton K.G., Atmospheric Chemistry of Acrolein and Methacrolein: Reactions with OH Radicals and Ozone. ESE Notes, 1999, 34, 7.

NARRATIVE

Before joining EPA as a Postdoctoral Fellow, Dr. Liu served as a Project Scientist and Work Assignment Leader as an EPA on-site contractor. In EPA's source characterization laboratories, she was involved in studies of organic emission characteristics of various sources such as alkyd paints, engineering wood products, toner, shower curtains, vinyl flooring, laminator, surfactants, and cleaners, Henry's law constants, and identification and measurement of volatile organic compounds (VOCs) in adhesives used on-site for building construction. She was also involved in studying the impact of ozone on indoor air quality, emissions from microwave popcorn, sink effect study for homeland security, impact of outdoor air toxics on indoor air concentrations, characterization of *stachybotrys chartarum* microbial volatile organic compound emissions, use of small chambers to examine transport mechanisms of residential use pesticides, buy clean, and penetration of gases and particles into the research house. In the next three years she will work primarily on characterization of PFOA emissions from indoor sources.

BIOGRAPHICAL SKETCH

NAME: Michael Loughran

POSITION TITLE: NPD support

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Lyndon State College, VT	B.S.	1983	Env. Education
Indiana University, Bloomington IN	M.S.	1989	Water Resources

PROFESSIONAL EXPERIENCE

9/06 – present: EPA/ORD: Technical support to DC-based National Program Directors

9/01 – 9/06: EPA/ORD: Program analyst, budget formulation of ORD budget request to Congress.

8/93 – 9/01: Project Manager and hydrologist for voluntary cleanup program with Minnesota Dept. of Agriculture.

8/89 – 8/93: Project Manager and hydrologist working on contaminated site investigations and cleanups with the Minnesota Pollution Control Agency.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Minnesota Groundwater Association

National Water Works Association

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Participant on several ORD research coordination teams including drinking water, water quality global change and endocrine disruptors programs. Performance and accountability workgroup member providing ORD-wide guidance on accountability issues.

BIOGRAPHICAL SKETCH

NAME: Robert W. Luebke

POSITION TITLE: Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of North Carolina at Chapel Hill	BS	1972	Medical Technology
University of North Carolina at Chapel Hill, School of Public Health	MSPH	1976	Parasitology-Lab. Practice
University of North Carolina at Chapel Hill, School of Public Health	PhD	1981	Parasitology-Lab. Practice

PROFESSIONAL EXPERIENCE

1981-1984, National Research Council Fellow, Experimental Biology Division, Health Effects Research Laboratory, U.S. EPA, Research Triangle Park, NC

1984-1987, Research Biologist, Perinatal Toxicology Branch, Developmental Biology Division, Health Effects Research Laboratory, U.S. EPA, Research Triangle Park, NC

1988-1990, Research Biologist, Inhalation Toxicology Branch, Environmental Toxicology Division, Health Effects Research Laboratory, U.S. EPA, Research Triangle Park, NC

1991-Present, Research Biologist, Immunotoxicology Branch, Environmental Toxicology Division, National Health and Environmental Effects Research Laboratory, U.S. EPA, Research Triangle Park, NC

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Toxicology (SOT), Immunotoxicology Specialty Section, Secretary/Treasurer (1999-2001), VP Elect and Chair, Program Committee(2002-2003), VP (2003-2004), President (2004-2005), Councilor (2005-2006), Nominating Committee (2005-2008). Associate Editor, Journal of Immunotoxicology. Reviewer for: Diabetologica, Environmental Health Perspectives, Environmental Research, Environmental Toxicology and Chemistry, Food and Chemical Toxicology, Fundamental and Applied Toxicology, Human and Ecological Risk Assessment, International Immunopharmacology, Journal of Leukocyte Biology, Journal of Applied Toxicology, Journal of Toxicology and Environmental Health, Photochemistry and Photobiology, Toxicology and Applied Pharmacology, Toxicology, Toxicological Sciences.

SELECTED AWARDS AND HONORS

Bronze Medal, US EPA, Promoting Strong Science in Agency Decisions, 2004

INVITED LECTURES/SYMPOSIA

Comparative immunology and immunotoxicology. Toxicological Extrapolation Across Species: Collaborative Opportunities and Needs Within NHEERL Human Health and Ecology Divisions, US EPA, Research Triangle Park, NC, August 10-12, 1999.

Aging and resistance to infection. Toxicology for the Next Millennium-New York Academy of Sciences, Warrenton, VA, September 20-23, 1999.

Pesticide-induced immunotoxicity: are humans at risk? Aquatic Toxicology Workshop, Edmonton, Alberta, Canada, October 2-6, 1999.

Environmental factors associated with the development of autoimmunity. Exploratory Meeting: Epidemiology of Occupational and Environmental Factors Associated with Autoimmunity, National Institute of Public Health and Environmental Protection, Bilthoven, The Netherlands, May 8-10, 2000.

“Immune system maturity and sensitivity to chemical exposure”. 2005 Toxicology and Risk Assessment Conference, Fairborn, OH, April 25-28, 2005.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY (2000-Present)

Epidemiology of Occupational and Environmental Factors Associated with Autoimmunity, National Institute of Public Health and Environmental Protection, Bilthoven, The Netherlands, May 8-10, 2000.

External Advisory Committee, Superfund Basic Research Program, Center for Integrative Toxicology, Michigan State University (2000-Present)

External member, Perfluorinated Compounds Research Planning Committee, NIEHS, NIH, (2005-Present)

Chaired organizing committee and presided over an international workshop to evaluate the utility of toxicogenomics in the practice of immunotoxicology and risk assessment (2005)

Co-editor, Immunotoxicology and Immunopharmacology, Third edition, CRC Press, Boca Raton, FL.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Advisor to the Office of Drinking water on immunotoxicology issues and data analysis

EPA Agency-wide CCL-microbes working group

NHEERL Aquatic Stressors Research Strategy workgroup

ORD and NHEERL Research Strategy workgroups

NHEERL Endocrine Disrupting Chemicals Workgroup

NHEERL Candidate Contaminant List Drinking Water multiyear plan writing team

Core Writing Team, EPA Immunotoxicity Risk Assessment Guidelines.

EPA Chemical Prioritization Community of Practice

EPA F1-Extended One-Generation Reproductive Study Review Panel

PUBLICATIONS (1998-Present, of 67 total peer reviewed; does not include book chapters)

French, A.F., C.B. Copeland, D.L. Andrews, W.C. Williams, M.M. Riddle, and R.W. Luebke. 1998. Evaluation of the potential immunotoxicity of chlorinated drinking water in mice. *Toxicology* 125, 53-58.

French, A. S., C. B. Copeland, D.L. Andrews, W.C. Williams, M. M. Riddle and R.W. Luebke. 1999. Evaluation of the potential immunotoxicity of bromodichloromethane in rats and mice. *J. Toxicol. Environ. Health* 56, 297-310.

Keil, D.E., R.W. Luebke, M.D. Ensley, P.D. Gerard and S.B. Pruett. 1999. Evaluation of multivariate statistical methods for analysis and modeling of immunotoxicology data. *Toxicol. Science* 51, 245-258.

Luebke, R.W., C. B. Copeland, and D.L. Andrews. 1999. Effects of aging on resistance to *Trichinella spiralis* infection in rodents exposed to 2,3,7,8-tetrachlorodibenzo-p-dioxin. *Toxicology* 136, 15-26.

Luebke, R.W., C.B. Copeland and D.L. Andrews. Aging and resistance to *Trichinella spiralis* infection following xenobiotic exposure. *Ann. N.Y. Acad. Sci.* 919, 221-229.

Guo, T.L., J.A. McCay, N.A. Karrow, G.W. Johnson, R.D. Brown, D.L. Musgrove, R.W. Luebke, D.R. Germolec and K.L. White, Jr. 2001. Immunotoxicity of sodium bromate in female B6C3F1 mice: A 28-day drinking water study. *Drug Chem. Toxicol.* 24, 129-49.

Karrow, N.A., T.L. Guo, J.A. McCay, G.W. Johnson, R.D. Brown, D.L. Musgrove, D.R. Germolec, R.W. Luebke, and K.L. White, Jr. 2001. Evaluation of the immunomodulatory effects of the disinfection byproduct, sodium chlorite, in female B6C3F1 mice: a drinking water study. *Chem. Toxicol.* 24, 239-258.

Luebke, R.W., C.B. Copeland, M. Daniels, A.L. Lambert and M.I. Gilmour. 2001. Suppression of allergic immune responses to house dust mite (HDM) in rats exposed to 2,3,7,8-TCDD. *Toxicol. Sci.* 62, 71-79.

Keil, D.E., R.W. Luebke and S.B. Pruett. 2001. Quantifying the relationship between multiple immunological parameters and host resistance: probing the limits of reductionism in a complex system. *J. Immunol.* 167, 4543-4552.

Luebke, R.W. 2002. Pesticide-induced immunotoxicity: Are humans at risk? *Human Ecol. Risk Assess.* 8, 293-302.

Luebke, R.W., C.B. Copeland, L.R. Bishop, M.J. Daniels and M.I. Gilmour. 2002. Mortality in dioxin-exposed mice infected with influenza: mitochondrial toxicity (Reye's-like syndrome) versus enhanced inflammation as the mode of action. *Toxicological Sciences* 69, 109-116.

Rooney, A.A., R. Matulka and R.W. Luebke. 2003. Developmental Atrazine Exposure Suppresses Immune Function in Male, but not Female Sprague-Dawley Rats. *Tox. Sci.* 76: 366-375.

Luebke, R.W., C.G. Parks, and M.I. Luster. 2004. Suppression of immune function and susceptibility to infections in humans: association of immune function with clinical disease. *J. Immunotoxicology* 1, 15-24.

Luebke, R.W., D.H. Chen, R.R. Dietert, Y. Yang, M. King, and M.I. Luster. 2006. The comparative immunotoxicity of 5 selected compounds following developmental or adult exposure. *J. Toxicol. Environ. Health, Part B* 9, 1-26.

DeWitt, J.C., C.B. Copeland, and R.W. Luebke. 2006. Immune responses in Sprague-Dawley rats exposed to dibutyltin dichloride in drinking water as adults. *J. Immunotoxicol.* 2, 151-160.

Burns-Naas, L.A., R.J. Dearman, D.R. Germolec, N.E. Kaminski, I. Kimber, G.S. Ladics, R.W. Luebke, J.C. Pfau, and S.B. Pruett. 2006. "Omics" Technologies and The Immune System, *Toxicol. Mechan. Meth.* 15, 101-119.

Luebke, R.W., D.H. Chen, R.R. Dietert, Y. Yang, M. King, and M.I. Luster. 2006. Immune system maturity and sensitivity to chemical exposure, *J. Toxicol. Environ. Health, Part A*, 69, 811-825.

Luebke, R.W., D.H. Chen, R.R. Dietert, Y. Yang and M.I. Luster. 2006. The comparative immunotoxicity of five selected compounds following developmental or adult exposure. *J. Toxicol. Environ. Health B, Crit. Rev.* 9, 1-26.

Luebke, R.W. Host resistance models, nematodes. 2006. *Methods* (in press).

Luebke, R.W., M.P. Holsapple, G.S. Ladics, M.I. Luster, M.J. Selgrade, R.J. Smialowicz, M.R. Woolhiser and D.R. Germolec. Immunotoxicogenomics: The potential of genomics technology in the immunotoxicity risk assessment process. *Toxicol. Sci.* (in press, 2006).

BIOGRAPHICAL SKETCH

NAME: David G. Lynch

POSITION TITLE: Environmental Scientist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Howard University, Washington, DC	B.S.	1979	Microbiology

PROFESSIONAL EXPERIENCE

1979 to Present Environmental Scientist, Office of Pollution Prevention and Toxics, USEPA, Washington, DC

SELECTED AWARDS AND HONORS

1996 Science Achievement Award in Health Sciences- OPPT Structure Activity Team

1997 OPPT Mission Award- Baltimore Community Environmental Partnership

2000 EPA Silver Medal- Rule to lower reporting thresholds of persistent, bioaccumulative and toxics for the Toxics Release Inventory (TRI)

2002 EPA Bonze Medal PBT Profiler design, development, collaborative partnership

2004 OPPT Mission Award PFOA (Perfluorooctanoic Acid)

2006 EPA Bronze Medal Section 21 Petition on Lead Wheel Balancing Weights

2006 EPA Bronze Medal POA/PFOS Risk Reduction

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Technical assistance to Environment Canada on the development and implementation of environmental fate and exposure assessment tools and models for new chemical substances.

Technical assistance to chemical industry stakeholders by providing training on the design and use of EPA environmental fate and exposure assessment tools and models to assist in the development of safer chemicals

Technical assistance to local communities through the development of a comprehensive air toxics risk screening methodology for local sources of air pollution.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Collaborative work on the development of USEPA and OECD harmonized test guidelines for Aerobic/Anaerobic Transformations in Soil, Activated Sludge Sorption Isotherm, and Estimation of the Adsorption Coefficient (Koc) on Soil and on Sewage Sludge using High Performance Liquid Chromatography (HPLC)

Collaborative work with ORD to identify research needs in emerging areas of environmental fate and exposure resulting in significant advances in the understanding of the behavior of toxic substances in the environment.

PUBLICATIONS

Boethling, R S, Lynch, DG and Thom, GC (2003) Predicting Ready Biodegradability of Premanufacture Notice Chemicals. Environ Toxicol Chem, **22**, 4, 837-844 .

Boethling, R S, Lynch, DG , Jaworska, JS, Tunkel, JL, Thom, GC, Webb, S. (2004). Using BiowinTM, Bayes, and Batteries to Predict Ready Biodegradability Environ Toxicol Chem, **23**, 4, 911-920 .

Boethling, RS, and Lynch, DG (2006) Biodegradation of US premanufacture notice chemicals in OECD tests.

Chemosphere *in press*

Lynch, DG (2000). Estimating the Properties of Synthetic Organic Dyes. In RS Boethling and D Mackay ed., *Handbook of Property Estimation Methods for Chemicals*, pp 447-467. Lewis Publishers, Boca Raton.

BIOGRAPHICAL SKETCH

NAME: Susan L. Makris

POSITION TITLE: Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Wisconsin, Milwaukee, WI; Madison, WI	B.S.	1967-1971	Genetics
American University, Washington, DC.	M.S.	1988-1991	Environmental Toxicology

PROFESSIONAL EXPERIENCE

1971-1974 Veterinary Technician, Butler Animal Hospital, Butler, WI
1974-1975 Toxicology Technician, Lakeside Laboratories, Milwaukee, WI
1975-1978 Group Leader, Reproduction and Teratology Laboratory, Litton Bionetics, Rockville, MD
1984-1991 Manager, Dept. of Toxicology, Scientific Resources, Hazleton Laboratories America, Vienna, VA
1991-2004 Toxicologist, USEPA/OPPTS/OPP/HED, Toxicology Branch
2003-2004 Acting Chief, USEPA/OPPTS/OPP/HED, Toxicology Branch
2004-Present Toxicologist, USEPA/ORD/NCEA-W, EICG

PROFESSIONAL SOCIETIES

Society of Toxicology (Immunotoxicology Specialty Section, Regulatory Committee member 2006)
National Capital Area Chapter – Society of Toxicology (Treasurer, 2001-2003; President, 2003-2004; Councilor, 2004-2005)
Society for Risk Analysis
National Capital Area Chapter – Society for Risk Analysis
Teratology Society (Co-chair of Terminology Committee, 2002-present)
Neurobehavioral Teratology Society
Middle Atlantic Reproduction and Teratology Association
Midwest Teratology Association
Washington Calligraphers Guild

SELECTED AWARDS AND HONORS

(6 selected from an overall total of 10)

EPA/OPPT Bronze Medal for commendable service in recognition of the rapid response to the petition to withdraw the developmental neurotoxicity test guideline (2005)
EPA/OGC Bronze Medal for commendable service on the PETA TSCA Section 21 Petition Team (2005)
EPA/ORD Bronze Medal for commendable service in the IRIS Reforms Implementation Steering Committee (2004)
EPA/ORD Bronze Medal for commendable service for completion of the Review of RfD and RfC Setting Processes (2003)
EPA/OPP Bronze Medal for commendable service for completion of the FQPA 10X Guidance Document (2002)
EPA Gold Medal for scientific excellence in the production of the Reproductive Toxicity Risk Assessment guidelines (1997)

INVITED LECTURES/SYMPOSIA

(14 presentations selected from an overall total of 41):

Makris, S.L. (2006) 1) Current agrochemical guidelines and future directions, 2) Developmental neurotoxicity, developmental immunotoxicity, and risk assessment; Course lectures, Modular Training Programme in Applied Toxicology, Reproductive Toxicology, University of Surrey, Guildford, UK, October 3-7 2006.
Makris, S.L. (2006) A US perspective on developmental neurotoxicity testing. AgChem Forum, Amsterdam,

- Netherlands, September 2006.
- Makris, S., K. Deener, V. Dellarco, E. Doyle, E. Cohen-Hubal, V. Moser, S. Padilla, and T. Stoker. (2006) Application of life-stage specific data in the risk assessment for children: case study presentation using pesticides. Platform/panel presentation for EPA Science Forum session on Innovations in Risk Assessment, Washington, DC, May 2006.
- Makris, S. (2006) Summary of concurrent sessions: policy and validation – reduction and refinement now. Presentation, Johns Hopkins University, Center for Alternatives to Animal Testing (CAAT), TestSmart DNT Symposium, Reston, VA, March 2006.
- Makris, S. (2005) US efforts on revision of terminology for development toxicology. Presentation, 5th Berlin Workshop on the Terminology in Developmental Toxicology, Berlin, FRG, October 27-29 2005.
- Makris, S.L. (2005) 1) Current agrochemical guidelines and future directions, 2) Developmental neurotoxicity and risk assessment, 3) A framework for developmental immunotoxicity testing; Course lectures, Modular Training Programme in Applied Toxicology, Reproductive Toxicology, University of Surrey, Guildford, UK, October 3-6 2005.
- Makris, S. (2005) Developmental neurotoxicity and risk assessment. Presentation, IRIS Chemical Managers Series, USEPA/ORD/NCEA, Washington, DC, August 2005.
- Makris, S. (2005) A framework for developmental immunotoxicity testing. Presentation, 45th Annual Teratology Society meeting, Sunrise Mini-course, St. Pete Beach, FL, June 2005.
- Ladics, GS; Chapin, RE; Hastings, KL; Holsapple, MP; Makris, SL; Sheets, LP; Woolhiser, MR, and Burns-Naas, LA. (2005) Developmental toxicology evaluations – issues with including neurotoxicology and immunotoxicology assessments on reproductive studies. Roundtable discussion Session, 44th Annual meeting of the Society of Toxicology, New Orleans, LA.
- Makris, S. (2005) Use of developmental toxicity data in risk assessment. Presentation, Society of Toxicology, “Developmental Toxicology” Continuing Education Course, New Orleans, LA, March 2005.
- Makris, S.L. (2004) Government perspective: USEPA/OPP experiences with juvenile animal testing. Presentation, American College of Toxicology, Continuing Education Course, Palm Springs, CA.
- Makris, S.L. (2004) Writing abstracts, Presentation, National Capital Area Chapter - Society of Toxicology, Career Day 2004 - Writing in the Sciences, Bethesda, MD.
- Makris, S.L. (2004) EPA perspective on developmental immunotoxicity testing and use in risk assessment, Presentation, Toxicology Forum, Summer 2004 Meeting, Aspen CO.
- Makris, S.L. (2004) A retrospective analysis of developmental neurotoxicity studies submitted to the USEPA, presentation abstract no. 630, 43rd Annual meeting of the Society of Toxicology, Baltimore, MD, The Toxicologist 78 (S-1):130.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

- Consultant, FDA/CDER, NDA review of developmental toxicity testing for Revalid, a thalidomide analog (September 2005)
- Panel Member, FDA/CDER Joint Meeting of the Nonprescription Drugs Advisory Committee and the Endocrinologic and Metabolic Drugs Advisory Committee; NDA review for OTC use of Mevacor (January 2005)
- Expert Panel Member, ILSI/RSI Working Group on Interpretation of Developmental Neurotoxicity Data (2004-present)
- Steering Committee Member, ILSI/HESI Working Group on Reproductive Endpoints (2004-present)
- Member/U.S. Expert, OECD Sub-Committee, Global Harmonization System (GHS) working group on labeling for reproductive toxicity (2003-present)

Committee Member, Society of Toxicologic Pathology, Oocyte Working Group (2002-2004)
Expert Panel Member, ILSI/RSI Working Group on Direct Dosing of Pre-Weaning Mammals (2001-2003)
Committee Member, Society for Toxicologic Pathology, Sperm Parameters Working Group (2000-2002)
Expert Panel Member, OECD Working Group on Developmental Neurotoxicity Guidelines (1994, 2001, 2005)

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Member, ORD/NCEA Hurricane Katrina Emergency Response Team (2005-2006)
Co-Chair, Risk Assessment Forum Task Force, Immunotoxicity Risk Assessment Guidelines (2004-present)
Co-Chair, ORD/NCEA PPRTV review team (2004-present)
Chair, OPP/HED Developmental Neurotoxicity Committee (2000-2004)
Member, Risk Assessment Forum Task Force, Reference Dose/Reference Concentration Working Group (1999-2002)
Member, OPP/HED FQPA Safety Factor Committee (1999-2002)
Member, OPP/HED RfD Committee and Hazard Identification Assessment Review Committee (1996-2004)
Co-Chair, OPPTS Developmental and Reproductive Toxicology Testing Working Group for guideline revision and harmonization (1994-1998)

PEER REVIEWED PUBLICATIONS

(10 publications from total of 14 papers and 3 book chapters, books and symposium papers)
Barone, S Jr; Brown, R; Euling, S; Cohen-Hubal, E; Kimmel, CA; Makris, SL; Moya, J; Selevan, SG; Sonawane, B; Thomas, T; Thompson, C. (2006) Visión general de la evaluación del riesgo en salud infantil empleando un enfoque por etapas de desarrollo. *Acta Toxicol. Argent.* 14 (Suplemento):7-10.
Makris, SL (2006) Regulatory considerations in developmental neurotoxicity of organophosphorus and carbamate pesticides. In: Gupta, R.C. (ed.) *Toxicology of Organophosphate and Carbamate Compounds*. Elsevier, Inc., New York, pp. 633-641.
Cooper, RL; Lamb, JC; Barlow, SM; Bentley, K; Brady, AM; Doerr, NG; Eisenbrandt DL; Fenner-Crisp, PA; Hines, RN; Irvine, L.; Kimmel, CA; Koeter, H; Li, AA; Makris, SL; Sheets, L; Speijers, GJA; Whitby, K. (2006) A tiered approach to life stages testing for agricultural chemical safety assessment. *Critical Reviews in Toxicology* 36:69-98.
Ladics, GS; Chapin, RE; Hastings, KL; Holsapple, MP; Makris, SL; Sheets, LP; Woolhiser, MR, and Burns-Naas, LA. (2005) Developmental toxicology evaluations – issues with including neurotoxicology and immunotoxicology assessments in reproductive toxicity studies. *Toxicological Sciences* 88(1):24-29.
Regan, KS; Cline, JM; Creasy, D; Davis, B; Foley, GL; Lanning, L; Lantendresse, JR; Makris, SL; Morton, D; Rehm, S; and Stebbins, K. (2005) STP position paper: ovarian follicular counting in the assessment of rodent reproductive toxicity. *Toxicologic Pathology* 33:409-412.
Kimmel, C.A., M.D. King, and S.L. Makris. (2005) Risk Assessment Perspectives for Developmental Immunotoxicity, In: Holladay, S.D. (ed.), *Developmental Immunotoxicology*, CRC Press, Washington, DC.
Holsapple, M.P., L.A. Burns-Naas, K.L. Hastings, G.S. Ladics, A.L. Lavin, S.L. Makris, Y. Yang, and M.I. Luster. (2005) A testing framework for developmental immunotoxicology (DIT): roundtable discussion. *Toxicological Sciences* 83(1):18-24.
Hurt, M.E., G. Daston, K. Davis-Bruno, M. Feuston, B. Silva Lima, S. Makris, M.E. McNERNEY, J.D. Sandler, K. Whitby, P. Wier, and G.D. Cappon. (2004) Workshop summary - Juvenile animal studies: testing strategies and design. *Birth Defects Research (Part B)* 71:281-288.
Iyer, P., J.L. Schardein, and S.L. Makris (2003) Agrochemicals: Developmental Toxicity/ Reproductive Toxicity. In: Plimmer, J.R., (ed.), *Encyclopedia of Agrochemicals*. Wiley Publishing, Inc., Indianapolis, IN.
Crofton, K.M., S.L. Makris, W.F. Sette, E. Mendez, and K.C. Raffaele. (2004) A qualitative retrospective analysis of positive control data in developmental neurotoxicity studies. *Neurobehavioral Toxicology and Teratology* 26:345-352.

GOVERNMENT REPORTS/GUIDANCE/GUIDELINES

(4 reports selected from an overall total of 15)

USEPA (2006) A framework for assessing health risks of environmental exposures to children (external draft). Office of Research and Development, National Center for Environmental Assessment, Washington, DC. EPA/600/R-05/067A.

USEPA (2005) Response to PETA “Petition to Compel the U.S. EPA to Repeal its Test Guidelines for Developmental Neurotoxicity.” Office of General Council, Washington, DC.

OECD (2004) Draft guidance document on reproductive toxicity testing and assessment. No. 43, OECD Environment,

Health and Safety Publications, Series on Testing and Assessment, OECD Environment Directorate, Paris, France. Available at: www.oecd.org/ehs

USEPA (2002) A review of the reference dose and reference concentration processes. Risk Assessment Forum, Washington, DC. EPA/630/P-02/002F. Available from:

http://oaspub.epa.gov/eims/eimscomm.getfile?p_download_id=36836

BIOGRAPHICAL SKETCH

NAME: Mark A. Mason

POSITION TITLE: Environmental Scientist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Oregon State University	B.S. M.S. Ph.D.	1972	Biology

PROFESSIONAL EXPERIENCE

1991-present Environmental Scientist, EPA/ORD/NRMRL/APPCD Indoor Environment Management Branch, Research Triangle Park, NC
1984-91 Scientist, Acurex Environmental Corp, Research Triangle Park, NC
1978-84 Scientist, Northrop Corp., Research Triangle Park, NC
1973-78 Senior Research Technician, Department of Environmental Sciences & Engineering, University of North Carolina at Chapel Hill, NC

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Air and Waste Management Association
American Chemical Society
American Society for Testing and Materials

SELECTED AWARDS AND HONORS

Exceptional/outstanding ORD Technical Assistance to the Regions or Program Offices, 2002
Exceptional/outstanding ORD Technical Assistance to the Regions or Program Offices, 2005

INVITED LECTURES/SYMPOSIA

“Characterizing emissions of reactive compounds from consumer products in a full-scale indoor air quality research chamber” invited presentation for an ASTM Conference on Indoor Emissions Testing: Methods and Interpretation, Sponsored by ASTM Committee D22 on Air Quality and Subcommittee D22-05 on Indoor Air. Washington, D.C., October 4-5, 2004.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

European Union Global Net Workshop, Ispra, Italy, June 20, 21, 2005, Indoor Source categorization/transport-fate. Contributing author to “Indoor Sources of Chemical Exposure, Rates, Transport and Fate, Research Needs and Program Plan.

International workshop on indoor air chemistry and health, Monterey, CA. July, 2004, Workshop outcome: document identifying consensus for research needs in indoor chemistry and health research, published in “Indoor Air”.

Science and Technology Advisory Committee to New York Indoor Environmental Quality Center, Inc. (NYIEQ), 2002 - 2004

BIFMA® Inc., Expert peer panel charged with providing advice and review on development of an emissions test method for determination of emissions from institutional office workstations and seating.

Technical Advisory Committee, Canadian National Research Council “Material Emissions and Indoor Air Quality –

2”, 1999 through 2003.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

List participation on major within-Agency workgroups; assistance to the Agency in developing testing guidelines, interpreting research advances, reviewing Program Office or Regional documents; and contributions to research planning and coordination efforts across Division, Agency labs, and Offices.

PUBLICATIONS

Stout II, D.M., **Mason, M.A.** The distribution of chlorpyrifos following a crack and crevice type application in the US EPA Indoor Air Quality Research House. *Atmospheric Environment* 37: 5539-5549 (2003).

Liu, X., **M. A. Mason**, K. Krebs, and L. E. Sparks, 2004. “Full-Scale chamber investigation and simulation of air freshener emissions in the presence of ozone,” *Environ Sci Tech.*, 2004, **38**, 2802-2812

_____, 2005. “Evaluation of the effectiveness of coatings in reducing dislodgeable arsenic, chromium, and copper from CCA treated wood,” U.S. EPA Report EPA/600/R-05/050. (Although no authors are explicitly identified for this report, M. A. Mason was co-author and editor.)

Mason, M, Sparks, L. Krebs, K., and Liu, X. “Impact of an ozone generator air cleaner on styrene concentrations in an indoor air quality research chamber”, in Proceedings of the 9th International Conference on Indoor Air Quality and Climate, Volume 2. Monterey, CA, June 30-July 5, 2002.

Mason, M. A., Sheldon, L. S., Guo, Z., and Stout II, D. M., “The distribution of chlorpyrifos in air , carpeting, and dust and its reemission from carpeting following the use of total release aerosols in an indoor air quality test house”, in Engineering Solutions to Indoor Air Quality Problems, Proceedings of a Symposium, July 17-19, 2000, Raleigh, NC October, 2000.

Mason, M. A., Sparks, L.E., Moore, S. A., Dolov, I., and Perry, R. B. “Characterization of ozone emissions from air cleaners equipped with ozone generators and sensor and feedback control circuitry”, in ”, in Engineering Solutions to Indoor Air Quality Problems, Proceedings of a Symposium, July 17-19, 2000, Raleigh, NC October, 2000.

Mason M. A. Guo, Z., Howard, E., Zhang, J.S., Nong, G., and Brown, S. , “ Comparison of the sink characteristics of three full-scale environmental chambers” in Proceedings of the 8th International Conference on Indoor Air Quality and Climate, Volume 5. Edinburgh, Scotland, August 1999.

NARRATIVE

Mr. Mason’s primary interest is development and application of source characterization methods and technologies to improve our understanding of the relationships between indoor and outdoor sources of contaminants, human activities and exposure in the built environment.

Over the past 22 years Mr. Mason has made significant contributions to the understanding of sources of indoor contaminants through development and use of small and full-scale emissions characterization test chambers. Mr. Mason played a key role in development of the 50 liter small chambers that are widely used to characterize source emissions in research laboratories, commercial test laboratories, and private manufacturing facilities in the U.S. and abroad. Mr. Mason developed the performance specifications and oversaw construction of EPA’s 30 m³ full-scale indoor air quality research chamber. Mr. Mason contributed to ASTM D5116, the Small Chamber Standard Guide and co-authored ASTM D 6670, Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products. Current and recent research focuses upon understanding pollutant transport across building shells, interactions of reactive compounds emitted by consumer products with ozone, fate and transport of pesticides applied indoors, and impact of coatings on dislodgeable arsenic residues on the surfaces of CCA-treated wood.

BIOGRAPHICAL SKETCH

NAME: Christopher S. Mazur POSITION TITLE: Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Mansfield University of Pennsylvania	B.A.	1993	Biology/Env.Science
University of Wyoming	M.S.	1995	Environmental Microbiology

PROFESSIONAL EXPERIENCE

1998 to Present: Research Biologist, EPA, Process and Modeling Branch, Ecosystems Research Division, NERL, Athens, GA.

1996 to 1998: Oak Ridge Institute for Science and Education Fellowship (ORISE), EPA, Process and Modeling Branch, Ecosystems Research Division, NERL, Athens, GA.

SELECTED AWARDS AND HONORS

STAA Award, Honorable Mention, 2005

STAA Award, Level III, 2004

STAA Award, Level III, 2003

INVITED LECTURES/SYMPOSIA

Ekman, D., Collette, T., Garrison, W., Kenneke, J., Mazur, C. Assessing Triazole Toxicity Using NMR-based Metabolomics. Presented at the U.S. Triazole Task Force (USTTF) meeting hosted by EPA. Raleigh, NC. March, 2006.

Mazur, C.S. and Kenneke, J.F. *In vitro* Metabolism of the Chiral Fungicide Bromuconazole 47 using Substrate Depletion and Product Formation Kinetics in Rat Hepatic Microsomes. International Society for the Study of Xenobiotics, 13 th N.A. October, 2005, Maui, Hawaii.

Kenneke, J.F. and Mazur, C.S. Enantioselective *In Vitro* Metabolism of the Triazole Fungicides Bromuconazole and Triadimefon using Rat Hepatic Microsomes. International Society for the Study of Xenobiotics, 13 th N.A. October, 2005, Maui, Hawaii.

Kenneke, J.F., Mazur, C.S., and Garrison, W.A. *In vitro* Phase I Metabolism of the Triazole Fungicide Bromuconazole and its Four Enantiomers. 230th ACS National Meeting, August, 2005, Washington, DC.

PUBLICATIONS

Mazur, C.S., Kenneke, J.F., Tebes-Stevens, C.T., Okino, M.S., and Lipscomb, J.C.

In vitro metabolism of the fungicide and environmental contaminant *trans*-bromuconazole and implications for risk assessment. In preparation.

Hoehamer, C., Mazur, C.S., Wolfe, L.N. Purification and partial characterization of an acid phosphatase from *Spirodela oligorrhiza* and its affinity for selected organophosphate pesticides. *Journal of Agriculture and Food Chemistry*. 2005, 53, 90-97.

Mazur, C.S., Jones, W.J. and Tebes-Stevens, C. H₂ consumption during the microbial reductive

dehalogenation of chlorinated phenols and perchloroethylene. *Biodegradation*. 2003, 14:285-295.

Mazur, C.S. and Jones, W.J. Hydrogen concentrations in sulfate-reducing estuarine sediments during PCE dehalogenation. *Environmental Science and Technology*. 2001, 35, 4783-4788.

Gao, J., Garrison, W.A., Mazur, C.S., Hoehamer, C., Wolfe, L.N. Uptake and phytotransformation of organophosphorus pesticides by axenically cultivated aquatic plants. *Journal of Agriculture and Food Chemistry*. 2000, 48, 6114-6120.

Gao, J., Garrison, W.A., Mazur, C.S., Hoehamer, C., Wolfe, L.N. Uptake and phytotransformation of o,p'-DDT and p,p'-DDT by axenically cultivated aquatic plants. *Journal of Agriculture and Food Chemistry*. 2000, 48, 6121-6127.

NARRATIVE

Our current research focuses on the *in vitro* metabolism of xenobiotics using rat hepatic microsomes. Determination of well-characterized kinetic parameters and transformation pathway(s) for chemical metabolism are imperative to accurately model physiological metabolic capacity within EPA's Computational Toxicology Research Program. Furthermore, research efforts are expanding to address areas of concern such as: 1.) the effect nonspecific binding has with regards to observed kinetic measurements 2.) the enantioselectivity of chiral substrates within *in vitro* cytochrome systems, 3.) comparing and contrasting microsomal systems with hepatocyte cell cultures and pure enzymes of interest using advanced analytical techniques, 4.) metabolic interspecies comparisons 5.) evaluating phase I and phase II metabolism.

BIOGRAPHICAL SKETCH

NAME: Marc Allyn Mills

POSITION TITLE: Environmental Engineer

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Texas A&M University	B.S.	1990	Civil/Env. Engineer.
Texas A&M University	M.S.	1994	Civil/Env. Engineer.
Texas A&M University	Ph.D.	1997	Civil/Env. Engineer.

PROFESSIONAL EXPERIENCE

2002 to Present, Environmental Engineer - USEPA ORD National Risk Management Research Laboratory, Sediment and Soils Management Branch, Cincinnati, OH 45268

2000 to 2002, Federal Post Doctoral Appointment - USEPA ORD National Risk Management Research Laboratory, Treatment and Destruction Branch, Cincinnati, OH 45268

1997 to 2000, Post Doctoral Fellowship - Oak Ridge Institute for Science and Education, USEPA, Cincinnati, OH 45268

2001 to Present, Adjunct Professorship - University of Cincinnati, Department of Civil and Environmental Engineering, Cincinnati, OH 45220

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Association of Environmental Engineering and Science Professors
American Chemical Society
Reviewer for Journal of Environmental Quality
Reviewer for Environmental Technology

SELECTED AWARDS AND HONORS

Federal Bronze Medal, USEPA, ORD, 2005.

Oakridge Institute for Science and Education (ORISE) Fellowship for Post-Doctoral Study, USEPA and USDOE, 1997-2000

Texas Higher Education Grant, 1992-1994

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

I have chaired sessions at the following conferences:

Society of Environmental Toxicology and Chemistry (SETAC) Battelle's International Symposium on Bioremediation and Biodegradation, and Battelle's International Symposium on Wetlands and Remediation.

I have participated in Workshops such as EPA Analytical methods development, SERDP/ESTCP Contaminated Sediments Workgroup, Remediation and Technology Discussion Forum - Contaminated Sediments.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

I am the Project lead for several multi-laboratory research projects on Contaminated Sediments that involves multiple

PIs at NRMRL, NERL, and the Region and other non-Agency researchers. The Lake Hartwell Monitored Natural Recovery study is nationally recognized as the only systematic evaluation of tools and techniques for monitoring the status of MNR. Early results are being incorporated by Region 4 in its ROD mandated monitoring for the Superfund site. I am also a co-PI on a multidisciplinary cross agency research team funded with funding from DOD-SERDP to evaluate the mechanisms responsible for contaminant migration through in-place sediment caps in an estuarine system.

I am also a member of the Remediation Technology Discussion Forum and more specifically the Contaminated Sediments and the Monitored Natural Recovery subgroup. As the sole EPA person on this group, I have been involved in the development of a number of research plans and proposals to secure funding for research in the area of MNR. This group currently has been asked to funded to develop a DOD guidance document as part of a DOD-ESTCP effort.

I have been actively involved in a number of federal sponsored workgroups to establish research strategies for DOD's SERDP/ESTCP program and a multi-Federal agency research group to guide EPA's research strategy on sediments.

I am also a member of an ORD team evaluating the sources and fate of fluorochemicals in the environment. The team as a whole is evaluating the generation and degradation potential of selected polymer in soils, sediments, and wastewater. Our immediate group is responsible for developing the methods and approaches for evaluating selected fluorotelemer based polymers in simulated wastewater treatment systems. This work was initiated via a direct request from OPPTS and has not being incorporated in the SP2 MYP.

I am also the Program Lead for EDCs in the National Risk Management Research Laboratory. I am responsible for coordinating and funding research in support of our APMs and APGs as defined in our MultiYear Plan. I am a member of the ORD EDC Planning Team under the direction of our National Program Director. I am the PI and lead on several EDC projects within NRMRL and in collaboration with NERL on EDCs in wastewater treatment, CAFOs, and Sediments.

PUBLICATIONS

Mills, M.A., J.S. Bonner, C.A. Page, R.L. Autenrieth (2004). "Evaluation of bioremediation strategies of a controlled oil release in a wetland." *Marine Pollution Bulletin*, Vol 49 Iss 5-6, Sept 2004, 425-435.

Mills, M.A., J.S. Bonner, T.J. McDonald, C.A. Page, R.L. Autenrieth (2001). "Intrinsic bioremediation of a petroleum impacted wetland." *Marine Pollution Bulletin*, Vol 46, Iss 7, July 2003, 887-899.

Mills, M.A., and Haines, J.H. (1999). "Organic Matter Characterization of PCB-Contaminated Sediments by CF-IRMS " *Bioremediation*, Submitted Sept 1999.

Mills, M.A., J.S. Bonner, T.J. McDonald, M.A. Simon, R.L. Autenrieth (1999). "Method for Quantifying the Fate of Petroleum in the Environment." *Chemosphere*, Vol. 39(14): 2563-2582, .

Mills, M.A., and Haines, J.R. (2004). "Method for Monitoring CO2 produced during biodegradation by CF-IRMS" *Chemosphere*, Submitted June 2004.

Mills M.A., Bonner, J.S., Simon, M.A., Page, C.A., Kanga, S., Autenrieth, R.L., **Biodegradation of hydrocarbons in petroleum-contaminated freshwater and sediments@ Waste Management**, Volume 13, Issues 5-7, 1993, Page 516
Page, C.A., Bonner, J.S., Kanga, S.A., **Mills, M.A.**, Autenrieth, R.L., (1999) "Biosurfactant solubilization of PAHs", *Environmental Engineering Science* 16(6) 465-474.

Kanga, S.A., J.S. Bonner, C.A. Page. **M.A. Mills**, R.L. Autenrieth, (1996). "Solubilization of Naphthalene and Methyl-Substituted Naphthalenes from Crude Oil Using Biosurfactants." *Environmental Science and Technology* Vol 30, No. 2, pp. 556-551.

Aldrett, S., J.S. Bonner, **M.A. Mills**, R.L. Autenrieth, F.L. Stephens, (1996). "Microbial Degradation of Crude Oil in Marine Environments Tested in a Flask Experiment." *Water Research* 31(11) 2840-2848.

Aldrett, S., J.S. Bonner, **M.A. Mills**, R.L. Autenrieth, F.L. Stephens, (1996). "Efficacy Testing of Petroleum Degradation by Commercially Available Products as Measured by Oil and Grease." Submitted to the *Journal of Hazardous Waste*, April, 1996.

NARRATIVE

I have been an active researcher in the areas of contaminated sediments, EDCs, PFOA, oil spill remediation, fate of organics in sediments and wetlands, and the use of stable isotope techniques for environmental monitoring. Currently, I am primarily currently focusing on contaminated sediments and EDCs. I am also one of three PIs in our Division responsible for developing a research program to support OPPTS on the fate of perfluorinated chemicals in the environment.

Conservation Foundation, Washington, DC (May 1985).

R. J. Miltner, "Treatment Modifications Along the Ohio", Short Courses in Water Supply Engineering, University of North Carolina, Chapel Hill (May 1978).

ASSISTANCE /LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

- 2005 On-site Organizer, Midwest Ultraviolet Disinfection Workshop, International Ultraviolet Association, Cincinnati, OH
- 1987 to present Member, eight Professional Advisory Committees, American Water Works Association Research Foundation
- 1991 - 1992 Unsolicited Proposal Selection Committees, American Water Works Association Research Foundation
- 1987 - 1993 Member, Activated Carbon Standards Committee, American Water Works Association
- 1984 - 1998 Member, eight MS Committees and one PhD Committee, Department of Civil and Environmental Engineering, University of Cincinnati

ASSISTANCE AND LEADERSHIP PROVIDED TO THE AGENCY

- 1993-1994 Member, Technical Workgroup for Negotiated Rulemaking for Disinfection/Disinfection By-Product and Information Collection Rules

Current research is in the following areas: (1) removal of pesticides from drinking water [for Office of Pesticide Programs, and for National Homeland Security Research Center], (2) formation and control of disinfection by-products [with three other ORD laboratories] and (3) creation of the Drinking Water Treatability Database.

PUBLICATIONS

1. J. Simmons, L. Teuscher, C. Gennings, T. Speth, S. Richardson, R. Miltner, M. Narotsky, K. Schenck, S. Hunter, R. Hertzberg and G. Rice, "Component-Based and Whole-Mixture Techniques for Addressing the Toxicity of Drinking Water Disinfection By-Product Mixtures", Journal of Toxicology and Environmental Health, Part A, 67:741-754 (2004).
2. P. Singer, C. Arlotta, N. Snider-Sajdak and R. Miltner, "Effectiveness of Pre- and Intermediate Ozonation on the Enhanced Coagulation of Disinfection By-Product Precursors in Drinking Water", Ozone Science & Engineering, 25:6:453 (2003).
3. J. Simmons, S. Richardson, T. Speth, R. Miltner, G. Rice, K. Schenck, S. Hunter and L. Teuschler, "Development of a Research Strategy for Integrated Technology-Based Toxicological and Chemical Evaluation of Complex Mixtures of Drinking Water Disinfection By-Products", Environmental Health Perspectives, 110:6:1013-1024 (2002).
4. J. Kim, J. Rennecker, R. Tomiak, B. Marinas, R. Miltner and J. Owens, "Inactivation of *Cryptosporidium* Oocysts in a Pilot-Scale Bubble-Diffuser Contactor - part II: Model Validation and Application", Journal of Environmental Engineering, 128:6:522 (2002).
5. N. Dugan, K. Fox, J. Owens and R. Miltner, "Controlling *Cryptosporidium* Oocysts Using Conventional Treatment", Journal American Water Works Association, 93: 12: 64 (2001).
6. J. Owens, R. Miltner, G. Rice, C. Johnson, D. Dahling, F. Schaefer and H. Shukairy, "Pilot-Scale Inactivation of *Cryptosporidium* and Other Microorganisms in Natural Water", Ozone Science & Engineering, 22:5:501:518 (2000).
7. T. Speth and R. Miltner, "Technical Note: Adsorption Capacity of GAC for Synthetic Organics", Journal American Water Works Association, 90:4:171 (1998).
8. G. Rice, K. Fox, R. Miltner, D. Lytle and C. Johnson, "Evaluating Pilot-Plant Performance with Endospores", Journal American Water Works Association, 88:9:122 (1996).
9. R. Miltner, R. Summers and J. Wang, "Biofiltration Performance: Part 2, Effects of Backwashing", Journal American Water Works Association, 87:12:64 (1995).
10. J. Wang, R. Summers and R. Miltner, "Biofiltration Performance: Part 1, Relationship to Biomass", Journal American Water Works Association, 87:12:55 (1995).
11. H. Shukairy, R. Miltner and R. Summers, "The Effect of Bromide on Disinfection By-Product Formation,

Speciation and Control: Part 2, Biotreatment”, Journal American Water Works Association, 87:10:71 (1995).

12. H. Shukairy, R. Miltner and R. Summers, “The Effect of Bromide on Disinfection By-Product Formation, Speciation and Control: Part 1, Ozonation”, Journal American Water Works Association, 86:6:72 (1994).
13. R. Miltner, H. Shukairy and R. Summers, “Disinfection By-Product Formation and Control by Ozonation and Biological Treatment”, Journal American Water Works Association, 84:11:53 (1992).
14. H. Shukairy, R. Miltner and R. Summers, “Control of Disinfection By-Products and Biodegradable Organic Matter Through Biological Treatment”, Revue des Sciences de l’Eau, vol. 5 (1992).
15. M. Pirbazari, B. Badriyha and R. Miltner, “GAC Adsorber Design for the Removal of Chlorinated Pesticides”, Journal of Environmental Engineering, 117:1:80 (1991).
16. T. Speth and R. Miltner, “Technical Note: GAC Adsorption Capacities for SOCs”, Journal American Water Works Association, 82:2:72 (1990).
17. Stevens, L. Moore and R. Miltner, “Formation and Control of Non-THM Disinfection By-Products”, Journal American Water Works Association, 81:8:54 (1989).
18. R. Miltner, D. Baker, C. Fronk and T. Speth, “The Treatment of Seasonal Pesticides in Surface Waters”, Journal American Water Works Association, 81:1:43 (1989).

PRESENTATIONS

J. Owens, R. Miltner, T. Slifko and J. Rose, “*In Vitro* Excystation and Infectivity in Mice and Cell Culture to Assess Chlorine Dioxide Inactivation of *Cryptosporidium* Oocysts”, Proceedings, Water Quality Technology Conference, American Water Works Association, Tampa, FL (1999).

R. Miltner, L. Ollier, T. Brown and R. Summers, “Assessing the Point of Application of Ozone During Conventional Treatment”, Proceedings: Water Research, Annual Conference, American Water Works Association, Dallas, TX (1998).

R. Miltner, H. Shukairy, G. Rice, J. Owens, F. Schaefer and D. Dahling, “Comparative Ozone Inactivation of *Cryptosporidium* and Other Microorganisms”, Proceedings, International Symposium on Waterborne *Cryptosporidium*, Newport Beach, CA (1997).

R. Miltner, R. Summers, N. Dugan, M. Koechling and D. Moll, “Comparative Evaluation of Biological Filters”, Proceedings, Water Quality Technology Conference, American Water Works Association, Boston, MA (1996).

D. Lytle, M. Dryfuse, R. Miltner, M. Schock and R. Summers, “An Evaluation of the Secondary Effects of Enhanced Coagulation”, Proceedings, Enhanced Coagulation Workshop, American Water Works Association, Charleston, SC (1994).

R. Miltner, S. Nolan, M. Dryfuse and R. Summers, “Evaluation of Enhanced Coagulation for DBP Control”, Proceedings, National Conference on Environmental Engineering, American Society of Civil Engineers, Boulder, CO (1994).

R. Miltner, “Transformation of NOM During Water Treatment”, Proceedings, Workshop on NOM, American Water Works Association Research Foundation, Chamonix, France (1993).

R. Miltner and R. Summers, “A Pilot-Scale Study of Biological Treatment”, Proceedings: Water Quality, Annual Conference, American Water Works Association, Vancouver, BC (1992).

R. Miltner, G. Rice and A. Stevens, “A Study of Ozone’s Role in Disinfection By-Product Control”, Proceedings, Conference on Ozone in Water and Waste Water Treatment, International Ozone Association, Shreveport, LA (1990).

R. Miltner, C. Fronk and T. Speth, “Removal of Alachlor from Drinking Water”, Proceedings, National Conference on Environmental Engineering, American Society of Civil Engineers, Orlando, FL (1987).

BIOGRAPHICAL SKETCH

NAME: Virginia (Ginger) C. Moser

POSITION TITLE: Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of North Carolina Chapel Hill	B.S.	1977	Pharmacy
Medical College of Virginia/Virginia Commonwealth University	Ph.D.	1983	Pharmacology and Toxicology

PROFESSIONAL EXPERIENCE

Present Toxicologist, Neurobehavioral Toxicology Branch, Neurotoxicology Division, US EPA, RTP, NC

2002-2006 Acting Chief, Neurobehavioral Toxicology Branch, Neurotoxicology Division

1998-present Adjunct faculty, Integrated Toxicology Program, Duke University, Durham, NC

2002-present Affiliated Associate Professor, Department of Pharmacology and Toxicology, Virginia Commonwealth University, Richmond, VA

1993-2002 Toxicologist, Neurobehavioral Toxicology Branch, Neurotoxicology Division

1985-1993 Toxicologist, ManTech Environmental Technology Inc., contractor to Neurotoxicology Division

1983-1985 NRC Postdoctoral Research Associate, Neurotoxicology Division

PROFESSIONAL SOCIETY INVOLVEMENT AND PUBLICATION BOARDS

(2001-2006)

Diplomate of the American Board of Toxicology, Society of Toxicology (SOT) (Career Resource and Development Committee, 2003-present), North Carolina Regional SOT (President, 2005-present), Women in Toxicology SOT Specialty Section (President, 2002-2005), Behavioral Toxicology Society (President, 2002-2005), International Neurotoxicology Society (newsletter editor, 2004-present), Neurobehavioral Teratology Society (Finance Committee, 2000-2003; Public Affairs Committee, 1999-2002)

Section Editor for Neurotoxicology, *Drug and Chemical Toxicology* (2004-present)

Editorial Board for *Toxicological Sciences* (1997-present), *Neurotoxicology* (1999-present), and *Neurotoxicology and Teratology* (2001-present)

SELECTED AWARDS AND HONORS

US EPA Science Achievement Award for Human Health (1999)

US EPA Bronze Medals for Commendable Service (1997, 2004, 2005)

US EPA Scientific and Technological Achievement Awards (1993, 2001)

INVITED LECTURES/SYMPOSIA (selected from 52 total)

American Society for Pharmacology and Experimental Therapeutics annual meeting, "Behavioral Pharmacology for Gene Jockeys" workshop, Orlando, FL, 2001

Twenty-first International Neurotoxicology Conference, "Infant and Child Neurotoxicity Studies: Subtle and Long-Term Effects" symposium, Honolulu, HI, 2004

US EPA OPP Risk Assessment Training and Certification Program, Washington, DC, 2004

NCSU Rodent Pathology Course: Pathology of the Nervous System, "Basics of Neuropathology and Behavioral Evaluation" symposium, Research Triangle Park, NC, 2004

International Neurotoxicology Association, "Pesticide Neurotoxicity as Reflected in Epidemiology and Toxicology" symposium, Porvoo, Finland, 2005

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

(Selected)

Steering Committee for ILSI/HESI Behavioral Testing Project Workgroup (2005-present)

ILSI Risk Science Institute, Expert Panel on Evaluation and Interpretation of Neurobehavioral Endpoints for Human Health Risk Assessment (2003-present)

Scientific organizing committee for International Neurotoxicology Association 2005 meeting

Program committee for FDA/OLAW/USDA workshop “Balancing Animal Welfare and Regulatory Compliance Issues in Preclinical Studies” (2003-2004)

ILSI Risk Science Institute, Expert Panel on Direct Dosing of Pups in Developmental Neurotoxicity Studies (2002-2003)

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

(Selected)

U.S. EPA Risk Assessment Forum (2004-present)

Safe Pesticides/Safe Products NHEERL Research Implementation Team (2003-present)

OPP Carbamate Cumulative Risk Assessment Workgroup (2003-present)

NHEERL/RTP Institutional Animal Care and Use Committee (2001-present)

OPP/HED OP Comparative Sensitivity DCI Team reviewing submitted protocols and data (1999-present)

PUBLICATIONS

(from 94 peer reviewed publications and 7 chapters/proceedings)

Moser VC, Shafer TJ, Ward TR, Meacham CA, Harris MW and Chapin RE. (2001) Neuro-toxicological outcomes of perinatal heptachlor exposure in the rat. *Tox. Sci.* **60**:315-326.

Moser VC, Barone S, Jr., Smialowicz RJ, Harris MW, Davis BJ, Overstreet D, Mauney M and Chapin RE. (2001) The effects of perinatal tebuconazole exposure on adult neurological, immunological, and reproductive function in rats. *Tox. Sci.* **62**:339-352.

Purkerson-Parker S, McDaniel KL and Moser VC. (2001) Dopamine transporter binding in the rat striatum is increased by gestational, perinatal, and adolescent exposure to heptachlor. *Tox. Sci.* **64**:216-223.

Moser VC, MacPhail RC and Gennings C. (2003) Neurobehavioral evaluations of mixtures of trichloroethylene, heptachlor, and di-(2-ethylhexyl)phthalate in a full-factorial design. *Toxicology* **188**:125-137.

McDaniel KL and Moser VC. (2004) Differential profiles of cholinesterase inhibition and neuro-behavioral effects in rats exposed to fenamiphos or profenofos. *Neurotoxicol. Teratol.* **26**:407-415.

Moser VC, Phillips PM, Levine AB, McDaniel KL, Sills RC, Jortner BS and Butt MT. (2004) Neurotoxicity produced by dibromoacetic acid in drinking water of rats. *Tox. Sci.* **79**: 112-122

Moser VC, Casey M, Hamm A, Carter, Jr. WH, Simmons JE, Gennings C. (2005). Neuro-toxicological and statistical analyses of a mixture of five organophosphorus pesticides using a ray design. *Tox. Sci.* **86**:101-115.

Moser VC, Phillips PM, McDaniel KL, Marshall RS, Hunter DL, Padilla S. (2005) Neurobehavioral effects of chronic dietary and repeated high-level exposure to chlorpyrifos in rats. *Tox. Sci.* **86**:375-386.

Moser VC, Simmons JE, Gennings C. (2006) Neurotoxicological interactions of a five-pesticide mixture in preweanling rats. *Tox. Sci.* **92**:235-245.

BIOGRAPHICAL SKETCH

NAME: William R. Mundy

POSITION TITLE: Research Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Massachusetts	B.S.	1979	Environmental Sci
University of Kentucky	M.S.	1983	Toxicology
University of Kentucky	Ph.D.	1987	Toxicology

PROFESSIONAL EXPERIENCE

1990 – Present Research Toxicologist, Neurotoxicology Division, USEPA
1987 – 1990 NIH Staff Fellow, National Institute of Environmental Health Sciences
1981 – 1987 Research Assistant, Graduate Program in Toxicology, Univ. of Kentucky
1980 – 1981 Toxicology Technician, Litton Bionetics Inc., Rockville, MD

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Toxicology, Society for Neuroscience, International Neurotoxicology Association, American Society for Neurochemistry

SELECTED AWARDS AND HONORS

EPA Bronze Medal for Commendable Service
EPA Scientific and Technological Achievement Award (3 times)
National Health and Environmental Effects Research Laboratory Strategic Goal Award
University of Kentucky Academic Excellence Scholarship

INVITED LECTURES/SYMPOSIA (2001-2005)

“General Principles for the Use of Primary Neuronal Cultures and Neuronal Cell Lines in Neurotoxicology Studies”,
Society of Toxicology, Salt Lake City, UT, 2003
“The Future: New Approaches for Developmental Neurotoxicity Testing”, Toxicology Forum, Aspen, CO, 2003
“Update on EPA/NTD planning for new methods for developmental neurotoxicity testing”, Johns Hopkins Center for Alternatives to Animal Testing (CAAT), Baltimore, MD, 2004
“New strategies for developmental neurotoxicity testing at the EPA”, European Commission Joint Research Centre, Ispra, Italy, 2005

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Organizer, Workshop on Research Issues in Aluminum Toxicity, Vancouver, British Columbia
Organizer, EPA Workshop on Aluminum Complexes and Neurotoxicity, Research Triangle Park
Symposium Chair, Persistent Bioaccumulative Toxics Session, 5th NHEERL Symposium on the Use of Indicators in Risk Assessment, Research Triangle Park
Member, Johns Hopkins Center for Alternatives to Animal Testing (CAAT) Steering Committee for Developmental Neurotoxicity Test Methods, Baltimore
Research grant reviewer for: NIEHS, NIOSH, Center for Alternatives to Animal Testing

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Contributor, evaluation of API submission for Fuel and Fuel Additives Test Rule for the Office of Science Policy, ORD
Contributor, evaluation of draft Toxicological Review of n-Hexane for NCEA/IRIS program
Contributor, evaluation of the draft OECD 426 Developmental Neurotoxicity Test Guidelines for the Office of Pesticide Programs
Contributor, scoping Meeting for ethyl tertiary butyl ether (ETBE) for the NCEA/IRIS program
Contributor, NHEERL Multi-Year Implementation Plan for Human Health
Chair, Long Term Goal 1 Workgroup, NHEERL Goal 4 Implementation Team
NTD Representative, NHEERL Computational Toxicology Implementation Committee
Team Lead, NTD Developmental Neurotoxicology working group for *in vitro* methods

PUBLICATIONS

(Represent 10 out of a total of 16 for the period 2000-2005)

- Mundy, W.R., Parran, D. and Barone Jr., S.: Gestational exposure to methylmercury alters neurotrophin- and carbachol-stimulated phosphatidylinositol hydrolysis in cerebral cortex of neonatal rats. *Neurotoxicity Res.* 1: 271-283, 2000.
- Mundy, W.R. and Freudenrich, T.M.: Sensitivity of immature neurons in culture to metal-induced changes in reactive oxygen species and intracellular calcium. *Neurotoxicology* 21:1135-1144, 2000.
- Parran, D.K., Mundy, W.R. and Barone, Jr., S.: Effects of methylmercury and mercuric chloride on differentiation and cell viability in PC12 cells. *Toxicol. Sci.* 59: 278-290, 2000.
- Inglefield, J.R., Mundy, W.R. and Shafer, T.J.: Inositol 1,4,5-triphosphate receptor-sensitive Ca²⁺ release, store-operated Ca²⁺ entry, and cAMP responsive element binding protein phosphorylation in developing cortical cells following exposure to polychlorinated biphenyls. *J. Pharmacol. Exp. Ther.* 297:762-773, 2001.
- Inglefield, J.R., Mundy, W.R., Meacham, C.A., and Shafer, T.J.: Identification of calcium-dependent and -independent signaling pathways involved in polychlorinated biphenyl-induced CREB phosphorylation in developing cortical neurons. *Neuroscience* 115:559-573, 2002.
- Parran, D.K., Barone Jr., S., and Mundy, W.R.: Methylmercury decreases NGF-induced TrkA autophosphorylation and neurite outgrowth in PC12 cells. *Dev. Brain Res.* 141:71-81, 2003.
- Barone Jr., S., Kodavanti, P.R.S. and Mundy, W.R.: Effects of toxicants on neural differentiation. In: *In Vitro Neurotoxicology: Principles and Challenges*. (E. Tiffany-Castiglioni, ed.). Humana Press, Totowa, NJ: 2003.
- Parran, D.K., Barone Jr., S., and Mundy, W.R.: Methylmercury inhibits TrkA signaling through the ERK1/2 cascade after NGF stimulation of PC12 cells. *Dev. Brain Res.* 149:53-61, 2004.
- Das, K.P., Freudenrich, T.M., and Mundy, W.R.: Assessment of PC12 cell differentiation and neurite growth: a comparison of morphological and neurochemical measures. *Neurotoxicol. Teratol.* 26:397-406, 2004.
- Mundy, W.R., Freudenrich, T.M., Crofton, K.M., and DeVito, M.J.: Accumulation of PBDE-47 in primary cultures of rat neocortical cells. *Toxicol. Sci.* 82:164-169, 2004.

BIOGRAPHICAL SKETCH

NAME: Wayne R. Munns, Jr. **POSITION TITLE:** Associate Director for Science, AED

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Washington	B.S.	1977	Zoology
University of Rhode Island	Ph.D.	1984	Biological Sciences

PROFESSIONAL EXPERIENCE

Associate Director for Science, Atlantic Ecology Division, EPA, 2000-present
Chief, Indicator Development Branch, Atlantic Ecology Division, EPA, 1997-2000
Research Ecologist (Ecological Risk Assessor), EPA, 1995-1997
Division Manager/Assistant Vice President, SAIC, 1991-1995
Senior Scientist, SAIC, 1983-1991
Adjunct Associate Professor, University of Rhode Island, Department of Biomedical Sciences, 1998-present

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Ecological Society of America, 1980-1990
Society of American Naturalists, 1978-1981
Sigma Xi, 1980-present
Society of Environmental Toxicology and Chemistry (SETAC), 1991-present
 Editorial Board of Environmental Toxicology and Chemistry, 1998-2000
SETAC Ecological Risk Assessment Advisory Group Workgroup Co-Chair, 2002-present
SETAC Ecological Risk Assessment Advisory Group Workgroup on Assessing Risks to Populations, 2001-present
 Board Member of North Atlantic Chapter, 1996-1999
 Chair, Nominations Committee of North Atlantic Chapter, 1998-1999
Society for Risk Analysis, 1999-2000
NE Chapter and Boston Risk Assessment Group, 1996-present
Guest editor for Human and Ecological Risk Assessment, 2002

SELECTED AWARDS AND HONORS

Science and Technology Achievement Award - Level III, EPA, 1999
Science and Technology Achievement Award - Level III, EPA, 2001
Bronze Medal for Innovation in Water Quality Criteria for the Protection of Aquatic Life: Saltwater Dissolved Oxygen, EPA Office of Water, 2002
Science and Technology Achievement Award - Honorable Mention, EPA, 2002
Human and Ecological Risk Assessment Best Paper of 2003 - Integrated Assessment Category, 2003
Science and Technology Achievement Award - Level II, EPA, 2003
Science and Technology Achievement Award - Honorable Mention, EPA, 2003
Science and Technology Achievement Award - Level III, EPA, 2004
Science and Technology Achievement Award - Level III, EPA, 2004
Science and Technology Achievement Award - Honorable Mention, EPA, 2004
Science and Technology Achievement Award - Honorable Mention, EPA, 2004
Special Accomplishment Recognition Award, EPA, 2005
Atlanta Federal Executive Board Award Finalist, 2006
ORD Honor Award for Exceptional/Outstanding ORD Technical Assistance to the Regions and Program Offices,

INVITED LECTURES/SYMPOSIA

(9 out of a total of 31 for the period 2002-2006)

Overcoming obstacles to population risk assessment. Issues in Assessing and Managing Ecological Risks at Contaminated Sediment Sites, Chicago, IL, June 2002.

Using models to extrapolate population-level effects from laboratory toxicity tests in support of population risk assessments. 23rd Annual Meeting of the Society of Environmental Toxicology and Chemistry, Salt Lake City, UT, November 2002.

Assessing risks to wildlife populations from multiple stressors: overview of problem and research needs. Symposium on Assessing Risks to Wildlife Populations from Multiple Stressors, Burlington, VT, September 2003.

Modeling approaches to population-level risk assessment. 24th Annual Meeting of the Society of Environmental Toxicology and Chemistry, Austin, TX, November 2003.

Use of models to support water quality criteria – A case study. European Science Foundation Scientific Programme ‘EcolMAT’ Workshop on Development of a Guideline to Select Applicable Mechanistic Models Aiming at Assessment of the Impact of Pollutants in Food-Chains. Prague, Czech Republic, April 2004.

Modeling approaches to population-level risk assessment. 14th Annual Meeting of the Society of Environmental Toxicology and Chemistry – Europe, Prague, Czech Republic, April 2004.

Recent research supporting population-level risk assessment. Japanese National Institute for Advanced Industrial Science and Technology, Research Center for Chemical Risk Management (AIST/CRM) Workshop on Risk Assessment and Risk Management for Chemicals. Research Center for Chemical Risk Management, Tsukuba, Japan, June 2004.

Benefits of integrated risk assessment in practice. Tenth International Congress of Toxicology (ICTX), Tampere, Finland, July 2004.

Predicting population-level effects using organism-based laboratory data. 2005 Toxicology and Risk Assessment Conference, Fairborn, OH, April 2005.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

World Health Organization International Programme on Chemical Safety (WHO IPCS) Steering Group for Approaches to Integrated Risk Assessment

WHO IPCS/OECD/U.S. EPA International Workshop on Integrated Risk Assessment. Orta, Italy, Steering Committee and Work Group Leader

European Science Foundation Scientific Programme ‘EcolMAT’ Workshop on Development of a Guideline to Select Applicable Mechanistic Models Aiming at Assessment of the Impact of Pollutants in Food-Chains. Prague, Czech Republic, invited presenter and panelist

Japanese National Institute for Advanced Industrial Science and Technology, Research Center for Chemical Risk Management (AIST/CRM) Workshop on Risk Assessment and Risk Management for Chemicals, invited presenter and panelist

EPA/U.S. Army Corps of Engineers/National Oceanic and Atmospheric Administration Bioaccumulation Guidance Work Group

Shrimp Virus Peer Review and Expert Workshop, Joint Subcommittee on Aquaculture Annual Meeting of the North Atlantic Chapter of SETAC, Program Chair

U.S. Army Corps of Engineers Fire Island to Montauk Point (FIMP) Conceptual Model Workshop, Work Group Leader

SETAC/SOT Pellston Workshop, Steering Committee

Symposium on Interpreting the Consequences of Bioaccumulation Related to Dredged Material Assessment and Management

Joint Canadian-United States Workshop on Jurisdiction of Sea Lice Treatment and Control

U.S. Army Corps of Engineers Environmental Risk Assessment and Dredged Material Management: Issues and Applications Workshop

Sea Grant Symposium on Sediment Toxicity Risk Assessment Tools: Where Are We and Where Should We Be

Going? Invited presenter and panelist
Symposium on Environmental Change and Human Health 2003, invited presenter
U.S. Army Corps of Engineers Bioaccumulation Guidance Workshop
City of Chicago Ecotoxicology Roundtable
Population Modeling training offered to the Hudson-Delaware Chapter of SETAC (2003)

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

EPA Risk Assessment Forum
EPA OPP EFED Selection Panel for Senior Scientist Position
Peer Review Panel, EPA Region 2/CENAN Framework for Evaluating Dredged Material for Proposed Placement at the HARS
Select Expert Review Team, Scientific Basis for Development of Dissolved Oxygen Criteria for Chesapeake Bay
EPA Stressor Identification Evaluation (SIE) Work Group
EPA STAR Grant Review Panel – Wildlife Research, Valuation for Environmental Policy, EcoHABS
EPA Ecological Benefits Assessment Strategic Plan, writing team
Fourth NHEERL Symposium on Research Advances in Risk Assessment: Extrapolation in Human Health and Ecological Risk Assessments, Symposium Chair
U.S. EPA Workshop on Ecological Benefits Assessment: Problem Formulation and Research Needs, Organizing Committee, Discussion Lead and Group Facilitator
Aging Americans: Impacts on Ecology and Environmental Quality Workshop, Planning Committee and Work Group Facilitator
Regional Assessment of Climate Change Impacts in the Southeast Workshop III: Integrated Assessment Options and Research Needs, Coastal Zone Breakout Group Tracker
Assessing Risks to Populations – Population Modeling training offered to EPA Ecological Risk Assessment Forum

PUBLICATIONS

(11 out of a total of 41 for the period 1998-2006)

- Kuhn A, Munns WR Jr, Poucher S, Champlin D, Lussier S. 2000. Prediction of population-level response from mysid toxicity test data using population modeling techniques. *Environmental Toxicology and Chemistry* 19:2364-2371.
- Kuhn A, Munns WR Jr, Champlin D, McKinney R, Tagliabue M, Serbst J, Gleason T. 2001. Evaluation of the efficacy of extrapolation population modeling to predict the dynamics of *Americamysis bahia* populations in the laboratory. *Environmental Toxicology and Chemistry* 20:213-221.
- Johnston RK, Munns WR Jr, Tyler PL, Marajh-Whittemore P, Finkelstein K, Munney K, Short FT, Melville A, Hahn S. 2002. Weighing the evidence of ecological risk of chemical contamination in the estuarine environment adjacent to the Portsmouth Naval Shipyard, Kittery, Maine, USA. *Environmental Toxicology and Chemistry* 21:182-194.
- Munns WR Jr. 2002. Axes of extrapolation in risk assessment. *Human and Ecological Risk Assessment* 8:19-29.
- Munns WR Jr, Berry W, DeWitt T. 2002. Toxicity testing, risk assessment, and options for dredged material management. *Marine Pollution Bulletin* 44:294-302.
- Munns WR Jr, Kroes R, Veith G, Suter GW II, Damstra T, Waters M. 2003. Approaches for integrated risk assessment. *Human and Ecological Risk Assessment* 9:267-272.
- Suter GW II, Vermeire T, Munns WR Jr, Sekizawa J. 2003. Framework for the integration of health and ecological risk assessment. *Human and Ecological Risk Assessment* 9:281-301.
- Munns WR Jr. 2006. Assessing risks to wildlife populations from multiple stressors: Overview of problem and research needs. *Ecology and Society* 11: 23. [online] URL: <http://www.ecologyandsociety.org/vol11/iss1/art23/>
- Munns WR Jr, Gervais J, Hoffman AA, Hommen U, Nacci DE, Nakamaru M, Sibly R, Topping CJ. (in press). Modeling approaches to population-level ecological risk assessment. In: Barnthouse LW, Munns WR Jr, Sorensen MT, editors. *Population-Level Ecological Risk Assessment* Boca Raton (FL): CRC Press/Taylor & Francis.
- Barnthouse, LW, Munns WR Jr., Sorensen MT (editors). (in press). *Population-Level Ecological Risk Assessment*.

CRC Press/Taylor & Francis, Boca Raton, FL.
Stahl, RG Jr., Kapustka L, Bruins RJF, Munns WR Jr. (editors). (in press). Valuation of Ecological Resources: Integration of Ecological Risk Assessment and Socio-economics to Support Environmental Decisions. CRC Press/Taylor & Francis, Boca Raton, FL.

Duties and Accomplishments: Performed a wide range of multi-test panels and individual assays on biological samples from clinical and forensic clients (primarily GC/MS and HPLC based). Assisted in establishing and validating an environmental microbiology testing laboratory.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

1996-present Sigma Xi
2003-present American Association for the Advancement of Science
2003-present Society of Toxicology

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

NCER Program Support Coordinator
Computational Toxicology Implementation Steering Committee

PUBLICATIONS

Mustra DJ, Warren AJ, Hamilton JW. Preferential binding of human full-length XPA and the minimal DNA binding domain (XPA-MF122) with the mitomycin C-DNA interstrand cross-link. *Biochemistry*. 2001 Jun 19;40(24):7158-64.

Warren AJ, Mustra DJ, Hamilton JW. Detection of mitomycin C-DNA adducts in human breast cancer cells grown in culture, as xenografted tumors in nude mice, and in biopsies of human breast cancer patient tumors as determined by (32)P-postlabeling. *Clin Cancer Res*. 2001 Apr;7(4):1033-42.

Salerni O.L.; Mustra D.J.; Emerich K.S.; Fuerst D.E. ; Zia-Ebrahimi M.; Van Tyle W.K. Synthesis of Bis-3-Alkyl-5-Arylhydantoin and Bis-3-Alkyl-5-Arylthio-Hydantoin Separated by Two and Four Carbon Atoms. *J. Heterocycl. Chem.* 1999, vol. 36, no5, pp. 1179-1182

Contributed to:

Paul R. Jensen, Erin Gontang, Chrisy Mafnas, Tracy J. Mincer, and William Fenical. Culturable marine actinomycete diversity from tropical Pacific Ocean sediments. *Environmental Microbiology* Volume 7 Page 1039 - July 2005

Joel N. Buxbaum. Diseases of protein conformation: what do in vitro experiments tell us about in vivo diseases? *Trends in Biochemical Sciences*, Volume 28, Issue 11, November 2003, Pages 585-592.

NARRATIVE



I joined the EPA's National Center for Environmental Research in the summer of 2004 after completing 3 years of postdoctoral research. I received my Ph.D. in Pharmacology & Toxicology from Dartmouth College in 2001, and my B.S. in Chemistry from Butler University in 1996.

I have developed a diverse body of scientific knowledge and work experience that has been undertaken in a highly international and multicultural environment, both in the U.S. and while traveling and conducting research abroad. Through my research training I have explored all aspects of the pharmaceutical sciences: from organic synthesis to the biological engineering of bioactive small molecules and proteins. During the course of my postdoctoral research position with the Center for Marine Biotechnology and Biomedicine at the Scripps Institution of Oceanography, I

worked on the collection, extraction, and purification of bioactive natural products from the marine microenvironment, followed by structural elucidation of compounds that tested positive for pharmacological activity. Lab based research was conducted in California as well on expeditions to Guam and Port Elizabeth, South Africa where I also proved my merit as a scientific research diver. In South Africa, where I served as our research group's lead scientific liaison, we conducted work in conjunction with our scientific partners from the University of Port Elizabeth and from Rhodes University in Grahamstown. My second postdoctoral research experience was in the Department of Molecular and Experimental Medicine at the Scripps Research Institute. My work there focused on the biophysical characterization of both wild-type and mutant forms of the protein transthyretin (TTR) as part of a collaborative drug discovery project and a clinical study to determine possible treatments of TTR based amyloid disease. With the EPA, through my work in science administration and policy, I have combined my strong analytical skills, scientific training, policy awareness, and administrative skills and applied them to the Agency's mandate to "protect human health and the environment."

It is my goal to develop a career path that will best position me to utilize my knowledge in science and health policy, and extensive training in the field of pharmaceutical sciences for the purpose of improving quality of health, and increasing science and health education and research. I am highly resourceful and have a strong sense of determination and direction that has been proven both in the research laboratory and through my work in government. Over the course of my experiences, I have also shown myself to be an effective leader in many diverse circumstances and environments.

As I continue to build a career that reaches beyond bench research in addressing issues that affect public health and safety, I look forward to applying myself to the many opportunities and challenges that lie ahead with an innovative and dynamic approach. I believe that I bring with me a positive and proactive spirit, as well as a combination of practical work experience and extensive technical training, which has prepared me to make an immediate and effective contribution to the arena of science and health policy.

BIOGRAPHICAL SKETCH

NAME: Diane Nacci

POSITION TITLE: Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Rhode Island	B.S.	1976	Zoology
University of Rhode Island	M.S.	1978	Biochemistry
University of Rhode Island	Ph.D.	2000	Biology

PROFESSIONAL EXPERIENCE

1984-1995 Supervisory Research Scientist, Science Applications International Corporation, Technical Support Contract to US EPA, Narragansett, RI, and Duluth, MN

1995-1996 Research Biologist, US Environmental Protection Agency
Office of Research and Development (ORD),
National Health and Environmental Effects Research Laboratory (NHEERL), Atlantic Ecology Division (AED), Narragansett, RI

2002 - 2003 Supervisory Research Biologist, Chief (acting) Population Ecology Branch, US EPA/AED

2003 - present Research Biologist, US EPA/AED

Undergraduate and Graduate Training Advisor

Rhode Island State Government Internship Program, Advisor 1996 – 1998; EPA-Morgan State University Summer Intern Program, Advisor 1996 – 2000; EPA National Network for Environmental Management Studies Program, Project Officer and Advisor 1996 – present; EPA Environmental Career Opportunities Training Program, Advisor 1998 – present; North East Regional Training Cooperative Agreement, Advisor 1998 – 2002; University of Rhode Island, Coastal Fellows Training Program, Advisor 2000 – 2003; EPA STAR Fellowship Program, Advisor 2000 – 2003; NHEERL Research Training Opportunities Program, Advisor 2003 – present; EPA Student Services Program, Contract Officer Representative and Mentor, 2004; EPA-Association School of Public Health Training Cooperative Agreement, Advisor 2003 – 2004

Post-Doctoral Training Advisor

EPA-Oak Ridge (ORISE) Research Associate Training Program, Advisor 2003 - present for Dr. Jeffrey Markert; EPA-National Research Council Research Associate Training Program, Advisor 1999 - 2003 for Dr. C. Sarah Cohen (current affiliation, San Francisco State University), Advisor 1999 - 2003 for Dr. Amy McMillan (current affiliation, Buffalo State University);

ORD Post-doctoral Fellowship Training Program, Mentor 2003 - 2005 for Dr. Jason Grear (NHEERL/AED), Mentor 2002 - present for Dr. Steven Walters (NHEERL/AED);

Faculty Advisor

RI INBRE (Idea Network of Biomedical Research Excellence, <http://www.uri.edu/inbre/>)

Mentor 2005 – present for Dr. David Taylor, Roger Williams University.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Ecological Society of America; North East Estuarine Research Society; Society of Environmental Toxicology and Chemistry; Society of Environmental Toxicology and Chemistry, North Atlantic Chapter Elected Board Member (June 2005); Society of Environmental Toxicology and Chemistry Environmental Risk Assessment Advisory Group, Member 2003 – present; American Association for the Advancement of Science

SELECTED AWARDS AND HONORS

RI Governor's Commendation for participation in Rhode Island Oil Spill Assessment, 1999

ORD Grant awarded for Endocrine Disruption Research, 1998
EPA Scientific and Technical Advancement Award (STAA) for Publications, 1998, 1999, 2000, 2001, 2002

INVITED LECTURES/SYMPOSIA

University of California, Davis, Bodega Bay Marine Laboratory Seminar Series, Invited Presenter 2000
Coastal and Estuarine Risk Assessment Forum, Virginia Institute of Marine Sciences, Invited Presenter and Panelist 2000
Rhode Island Natural History Society Annual Meeting, 'Endocrine Disruptors in Narragansett Bay: Model experimental systems using native estuarine species', Invited Presenter 2003
Society for Environmental Toxicology and Chemistry Pellston Workshop on 'Population-level Ecological Risk Assessment', Roskilde, Denmark, Invited Presenter and Participant August, 2003
American Fisheries Society Symposium, 'Human Impacts on the Genetics and Ecology of Wild Populations', Quebec, Canada, Invited Presenter August, 2003
Bilateral Workshop on Biomarkers in Human and Ecological Risk Assessment, Invited Presenter and Participant, Charleston, SC, January, 2006

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Northeastern Ecosystem Research Cooperative Workshop I, II, III 'Assessing the depositional, geological, geographical and biological factors the control mercury deposition in aquatic ecosystems of northeastern North America', Invited Participant 2001, 2002, 2003
EMAP Symposium 2001: Coastal monitoring through partnerships. Symposium 'Genetic Indicators in Environmental Protection', Pensacola Beach, FL, Invited Participant 2001
Society of Environmental Chemistry and Toxicology, Symposium on Genetic Responses, Chair 2001
Society for Environmental Toxicology and Chemistry Workshop, 'Ecological Perspective of Genomics: Assessing Ecological Risk Through Partnerships', Invited Participant 2002
International Pellston Workshop on Population-level Ecological Risk Assessment, Lead for Genetics section, 2003
The Wildlife Society Symposium, 'Effects of Multiple Stressors', Co-chair 2003
NHEERL - Cornell University Laboratory of Ornithology Cooperative Agreement # CR830402, 'Avian Risk Assessment for Multiple Human-caused Stressors Through Citizen Science Monitoring of Bird Populations', Lead Scientist and Project Officer 2002 - present
NHEERL/Research Training Opportunity Program Geospatial Statistics Training Workshop, Co-Chair 2002
EPA STAR Cooperative Agreement #CR82-9085, "Evaluating the Impact of Multiple Stressors on Common Loon Population Demographics - An Integrated Laboratory and Field Approach", Lead Scientist 2003 - present.
Fundulus Genomics Strategy Workshop, Invited Participant, 2006

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

NHEERL Aquatic Stressors Multi-Year Implementation Planning Committee, Toxics workgroup, AED Representative Member, 1999 - present
NHEERL Synergy Committee, AED Representative Member, 2000 - 2003
NHEERL Genomics and Proteomics Program Committee, AED Representative Member, 2001 - 2005
NHEERL Safe Pesticides/Safe Products (SP2) Multi-Year Implementation Planning Committee, Steering Committee Member, Long-Term Goal 2 (LTG2, Probabilistic Ecological Risk Assessment methods) Co-Chair, 2001 - present
NHEERL Computational Toxicology Implementation Planning Committee, AED Representative Member, 2003 - 2005
NHEERL Synergy Committee-Sponsored Symposium, 'Effects of Mercury and other Stressors to Piscivorous Bird Populations', Narragansett, RI, Lead Scientist 2000
NHEERL Workshop on 'Partnerships for Environmental Data Sharing: NHEERL's Wildlife Risk Assessment Demonstration Project, Lead Scientist and Chair 2001
EPA Environmental Monitoring and Assessment Program Symposium on 'The Application of Genomic Technologies', Co-Chair 2001
EPA Region IX - NHEERL for 'Development of Toxicity Test Methods using Echinoderm Species indigenous to the

Pacific Insular Areas', Lead Scientist 2002 - present

SELECTED RECENT PUBLICATIONS

- Nacci, D., Coiro, L., Kuhn, A., Champlin, D., Munns, W.R., Jr., Specker, J., and Cooper, K. 1998. A fish embryonic EROD bioassay. *Environmental Toxicology and Chemistry* 17(12): 2481-2486. EPA STAA III
- Nacci, D., Coiro, L., Champlin, D., Jayaraman, S., McKinney, R., Gleason, T., Munns, W.R., Jr., Specker, J., and Cooper, K. 1999. Adaptation of wild fish populations to dioxin-like environmental contamination. *Marine Biology* 134: 9-17. EPA STAA III
- Nacci, D., Serbst, J., Gleason, T., Cayula, S., and Munns, W.R., Jr. 2000. Characterizing biological responses to lead contamination for an estuarine ecological risk assessment. *Journal of Aquatic Ecosystem Stress and Recovery* 7: 187-199.
- Nacci, D., Jayaraman, S., and Specker, J. 2001. Stored Retinoids in Populations of an Estuarine Fish, *Fundulus heteroclitus*, Indigenous to Highly PCB-Contaminated and Reference Sites. *Archives Environmental Contamination and Toxicology* 40(4): 511-518. EPA STAA Honorable Mention
- Nacci, D., Gleason, T., Gutjahr-Gobell, R., Huber, M., and Munns, W.R., Jr. 2002. Effects of Environmental Stressors on Wildlife Populations: In Coastal and Estuarine Risk Assessment: Risk on the Edge. Editor: Newman, M.C. CRC Press/Lewis Publishers, Washington, DC. EPA STAA Honorable Mention
- Meyer, J.N., Nacci, D., and Di Giulio, R.T. 2002. Cytochrome P4501A (CYP1A) in killifish (*Fundulus heteroclitus*): heritability of altered expression and relationship to survival in contaminated sediments. *Toxicological Sciences* 68: 69-81.
- Nacci, D., Kohan, M., Coiro, L., and George, E. 2002. Effects of Benzo(a)pyrene Exposure on a PCB-adapted Fish Population. *Aquatic Toxicology* 57: 203-215. EPA STAA Honorable Mention
- Nacci, D., Coiro, L., Champlin, D., Jayaraman, S., and McKinney, R. 2002. Predicting the Occurrence of Genetic Adaptation to Dioxinlike Compounds in Populations of the Estuarine Fish *Fundulus heteroclitus*. *Environmental Toxicology and Chemistry*. 21(7): 1525-1532. EPA STAA Honorable Mention
- Nacci, D., Gleason, T., and Munns, W.R., Jr. 2002. Evolutionary and ecological effects of multi-generational exposures to anthropogenic stressors. *Human and Ecological Risk Assessment* 8(1): 91-97. EPA STAA Honorable Mention
- Roark, S.A., Nacci, D., Coiro, L., Champlin, D., and Guttman, S.I. 2004. Population genetic structure of a non-migratory marine fish *Fundulus heteroclitus* across a strong gradient of PCB contamination. *Environmental Toxicology and Chemistry* 24(3): 717 - 725.
- Nacci, D., Pelletier, M., Lake, J., Bennett, R., Nichols, J., Haebler, R., Grear, J., Kuhn, A., Copeland, J., Nicholson, M., Walters, S., and Munns, W.R., Jr. 2005. Predicting Wildlife Population Effects from Mercury and Other Stressors. *Ecotoxicology* 14(1 - 2): 283 - 293.
- Nacci, D., Coiro, L., Wasserman, D., and Di Giulio, R. 2005. A non-destructive technique to measure Cytochrome P4501A enzyme activity in living embryos of the estuarine fish *Fundulus heteroclitus*. In: *Techniques in Aquatic Toxicology, Volume 2*, Editor: Ostrander, G.K. Taylor and Francis, Boca Raton, FL, 209-225.
- McMillan, A.M., Bagley, M.J., Jackson, S.A., Nacci, D.E. 2006. Genetic diversity and structure of an estuarine fish (*Fundulus heteroclitus*) indigenous to sites associated with a highly contaminated urban harbor. *Ecotoxicology* (in press).
- Nacci, D., and Hoffmann, A. 2006. Genetic variation in population-level ecological risk assessment. In: *Population-level ecological risk assessment*. Editors: Barnhouse, L., Munns, W.R., Jr., and Sorenson, M. Society of Environmental Toxicology and Chemistry, Pensacola, FL (in press).
- Van Veld, P. A., and Nacci, D. 2006. Chemical Tolerance: acclimation and adaptations to chemical stress. In: *The Toxicology of Fishes*. Editors: Di Giulio, R.T., and Hinton, D.E. Taylor and Francis, Washington, DC (in press).
- Nacci, D., Walters, S., Gleason, T., and Munns, W.R., Jr. 2006. Using a spatial modeling approach to explore ecological factors relevant to the persistence of estuarine fish (*Fundulus heteroclitus*) in a PCB-contaminated estuary In: *Population-level Ecotoxicology*, Editor: R. Akcakaya. (accepted).
- Cohen, C.S., Tirindelli, J., Gomez-Chiarri, M., and Nacci, D. 2006. Functional implications of Major histocompatibility variation using estuarine fish populations. *Integrative & Comparative Biology* (accepted)

BIOGRAPHICAL SKETCH

NAME: Laura A. Nagy

POSITION TITLE: NHEERL PostDoctoral Fellow

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Oberlin College, OH	B.A.	1992	Biology
University of Arkansas, Fayetteville	M.S.	1996	Zoology
Dartmouth College, Hanover	Ph.D.	2002	Evolution and Ecology

PROFESSIONAL EXPERIENCE

2002-present: NHEERL PostDoctoral Fellow

2002-present: Courtesy Assistant Professor, Oregon State University, OR

1997-2002: Graduate teaching assistant, Dartmouth College, Hanover, NH

1996-1997: Wildlife biologist, U.S. Fish & Wildlife Service, Austin, TX

1997: Entomology research assistant, Univ. of Arkansas

1993: Research assistant, Univ. of Arizona

1993: Bird-banding assistant, Univ. of California Berkeley

1992-1993: Research assistant, Manomet Center for Conservation Sciences, Manomet, MA

1990-1992: Research assistant, Oberlin College

1990: Research assistant, U.S. Forest Service, Happy Camp, CA

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Ecological Society of America

American Ornithologists Union

Cooper Ornithological Society

SELECTED AWARDS AND HONORS

Gilman Fellow, Dartmouth College, 2001

2001 recipient of doctoral dissertation grant from National Science Foundation

2001 Sigma Xi grant in aid of research

American Ornithologists' Union 2001 student research award and 2001 student travel award

INVITED LECTURES/SYMPOSIA

2006, "Human and natural influences on avian population dynamics" for the Biology Department, Appalachian State University

2006, "Human and natural influences on avian population dynamics" for the Biology Department, University of British Columbia

2005, "Human and natural influences on avian population dynamics" for the Biology Department, Millikin University

2005, "From individuals to populations" for the Biology Department Seminar, Portland State University.

2005, "Risk assessment modeling" for the Intersection of Independent Perspectives workshop (EPA/Oregon State University collaboration)

2004: Resume workshop for the Fish and Wildlife Department, Oregon State University.

2004: "Invasive species: characteristics and consequences" to the Wildlife Ecology Class at Oregon State University.

2004: "Applying for jobs: Where to look and what to say" for the Biology Symposium, Oregon State University.
2003: "Causes and consequences of individual variation in reproductive output in a forest-dwelling Neotropical migrant songbird" in the Fish and Wildlife Seminar series at Oregon State University

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Reviewer for National Science Foundation (2004-present)
Reviewer for professional journals (Ecology, Auk, Wilson Bulletin, Condor, Journal of Applied Ecology)
Planner for American Ornithological Union national meeting (2006)
Reviewer for student awards (Cooper Ornithological Society, Ecological Society of America, Society for Environmental Toxicology and Chemistry)

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Reviewer for STAR grants

PUBLICATIONS

Nagy, L.R. and M. Etterson. (in review, Integrated Environmental Assessment and Management). Population models:
 where are we now?
Etterson, M.A. and L.R. Nagy (in review, Ecology Letters) Sources, sinks, and model accuracy.
Stansulescu*, D., L. R. Nagy and R. T. Holmes. (in review, Condor). Mass loss by breeding female songbirds: food supplementation supports the energetic stress hypothesis.
Nagy, L. R., J. Orme-Zaveleta, A. Fairbrother, and M. Etterson. (in press, Human and Ecological Risk Assessment). The intersection of independent lies in ecological risk assessment. .
Etterson, M. A., L. R. Nagy, and T. Robinson. (In press, Auk). Partitioning risk among different sources of nest failure.
Nagy, L. R. and R. T. Holmes. 2005. To double brood or not? Individual variation in the reproductive effort in black-throated blue warblers (*Dendroica caerulescens*). *Auk* 122: 902-914.
Nagy, L. R. and R. T. Holmes. 2005. Food limits annual fecundity of a migratory songbird: an experimental study. *Ecology* 86: 675-681.
Nagy, L. R. and R. T. Holmes. 2004. Factors influencing fecundity in migratory songbirds: is nest predation the most important? *Journal of Avian Biology* 35: 487-491.
Jones, J., P. J. Doran, L. R. Nagy, and R. T. Holmes. 2004. The relationship between Mayfield nest survival estimates and seasonal fecundity: a cautionary note. *Auk* 122: 306-312.
Stephen, F.M. M.P. Lih, G.W. Wallis, K.G. Smith and L.R. Nagy. 1998. Effects of a gypsy moth eradication project on nontarget arthropod and avian communities in the Ozark mountains of Arkansas. Pages 97-102 in Proceedings of the Actas Congreso Internacional de Plagas Forestales, Pucon, IX Region, Chile.
Nagy, L.R., and K.G. Smith. 1997. Effects of insecticide-induced reduction in lepidopteran larvae on reproductive success of Hooded Warblers. *Auk* 144:619-627.
Rimmer, C.C., J.L. Atwood, K.P. McFarland, S.H. Tsai and L.R. Nagy. 1996. Distribution of Bicknell's Thrush in New England and New York. *Wilson Bulletin* 108:650-661.

BIOGRAPHICAL SKETCH

NAME: Shoji Nakayama

POSITION TITLE: ORISE Postdoctoral Fellow

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Okayama University, Japan	M.D.	1999	Medical Doctor
Okayama University, Japan	Ph.D.	2004	Public Health

PROFESSIONAL EXPERIENCE

August 2005–present – Environmental Scientist, Methods Development and Application Branch, Human Exposure and Atmospheric Sciences Division, National Exposure Research Laboratory, U.S. EPA, Research Triangle Park, NC – Current Research Theme: Studies on the method development of measuring persistent perfluorinated organic compounds in the various samples, especially in natural water. These studies consist of a sample collection method, including determination of a proper sample container, proper sampling procedure, storage, stability, and recovery; an extraction method that enables us to concentrate trace levels of the compounds; an elution method including seeking a proper solvent and a proper treatment of the eluate; and determination of an analytical method of the final eluate. The goal is to establish a method of measuring persistent perfluorinated organic compounds, which is most appropriate and easy to install for many other institutions in the United States. It will enable us to know the impact and the fate of these compounds and to properly regulate the emission of them into the environment.

April–July 2005 – Senior Researcher, Department of Health and Environmental Sciences, Kyoto University Graduate School of Medicine, Kyoto, Japan – Conducted research on perfluorinated organic compounds using LC/MS/MS and GC/MS in Kyoto main laboratory and at colleagues' laboratory in Iwate, which is the pioneer of these compounds around the world.

April 2003–March 2005 – Lecturer, Department of Clinical Pharmacy, School of Pharmacy, Shujitsu University, Okayama, Japan – Taught: Education on Public Health, Anatomy, Histology, Pathology, Physiology, Physics, and experimental skills. Developed a new system for measuring time-weighted average concentrations of waterborne pollutants, especially polycyclic aromatic hydrocarbons (PAHs) and agricultural chemicals. Determined the mutagenicity of these compounds with mutagenicity assay (Ames test and umu test). Sought an anti-mutagen in an ingredient of several materials. Conducted molecular and biochemical studies on signal transduction proteins of endocytosis.

May 2003–July 2005 – Occupational Physician – Inspected factories, monitored and managed employees' health and factory regulatory actions.

May 1999–July 2005 – Practiced in Japan as a general physician at a department of internal medicine and emergency room.

INVITED LECTURES/SYMPOSIA

Shoji Nakayama, et al., Perfluorinated Organic Compound in the Water Environment. Invited lecture, International Conference on Environmental and Genetical Damage, November 3–6, 2005, Chongqing, China.

Shoji Nakayama, Exposure Assessment Research on Perfluorinated Organic Compounds. Invited lecture, China Medical University, Shenyang, China November 2, 2005.

Shoji Nakayama, et al., Exposure Assessment Research on Perfluorinated Organic Compounds. Invited lecture,

National Institute of Environmental Studies, Tsukuba, Japan, October 31, 2005.

SELECTED PUBLICATIONS

Harada K, Nakanishi S, Sasaki K, Furuyama K, **Nakayama S**, Saito N, Yamakawa K, Koizumi A. Particle Size Distribution and Respiratory Deposition Estimates of Airborne Perfluorooctanoate and Perfluorooctanesulfonate in Kyoto Area, Japan. *Bull Environ Contam Toxicol* 2006; 76: 306–310.

Nakayama S, Harada K, Inoue K, Sasaki K, Seery B, Saito N, Koizumi A. Distributions of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) in Japan and their toxicities. *Environ Sci* 2005; 12(6): 293–313.

Nakayama S, Nishide T, Horike T, Kishimoto T and Kira S Evaluation of the efficiency of respiratory protective equipment base on the biological monitoring of styrene in fibreglass reinforced plastics industries. *J Occup Health* 2004; 46: 132–40.

Nogami Y, Kobayashi K, Miyanaga M, **Nakayama S**, Takigawa T, Kira S Time-space distribution of heavy metals in mussel in the Seto Inland Sea, Japan. *Marine Environmental Research Special Issue* 2002; 54: 371.

Kira S, **Nakayama S**, Takigawa T, Seki A, Wang DH, Yamamoto H, Nogami Y, Matsuda T, Ito T, Fujisawa K, Hayatsu H Monitoring of mutagenic activity in water and mussels in the Seto Inland Sea, Japan. *Marine Environmental Research, Special Issue* 2002; 54: 535.

Seki A, Takehara H, Takigawa T, Hidehira T, **Nakayama S**, Usami M, Uchida G and Kira S Use of material safety data sheets at workplaces handling harmful substances in Okayama, Japan. *J Occup Health* 2001; 43: 95–100.

Ito T, Yoshitome K, **Nakayama S**, Kira S and Horike T Effect of m-xylene on [35S]t-butylbicyclo-phosphorothionate binding in the rat brain. *Soc Neurosci Abstr* 2000 26(2), 2080.

BIOGRAPHICAL SKETCH

NAME: John Nichols

POSITION TITLE: Research Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Washington	B.A.	1978	Zoology
University of Washington	M.S.	1981	Fisheries
Oregon State University	Ph.D.	1987	Toxicology

PROFESSIONAL EXPERIENCE

1994-Present Adjunct Associate Professor, University of Minnesota-Duluth, School of Medicine
1991-Present Research Toxicologist, U.S. EPA, Duluth, MN
1990-1991 Senior Scientist, AScI Corporation, Duluth, MN
1988-1990 Toxicokineticist, U.S. EPA, Duluth, MN

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Member, Society of Toxicology
Member, Northland Chapter, Society of Toxicology
Councilor, Northland Chapter, Society of Toxicology, 2006 to present
Member, Society for Environmental Toxicology and Chemistry
Member, Midwest Chapter, Society for Environmental Toxicology and Chemistry

SELECTED AWARDS AND HONORS

Scientific and Technological Achievement Award, U.S. EPA, 2005, "A physiologically based toxicokinetic model for dietary uptake of hydrophobic organic compounds by fish".
ORD Science Communications Award, 2004, for contributions to an Ecotoxicology Special Issue of Environmental Science and Technology.
Scientific and Technological Achievement Award, U.S. EPA, 1999, "Physiologically based toxicokinetic model for maternal transfer of 2,3,7,8- tetrachlorodibenzo-p-dioxin in brook trout (*Salvelinus fontinalis*)".
Special Act Award, U.S. EPA, 1999, for development of an NHEERL Wildlife Research Strategy.
ACTION Award (Silver Medal), U.S. EPA, 1997, for contributions to Mercury Study Report to Congress.
Scientific and Technological Achievement Award, U.S. EPA, 1997, "A physiologically based toxicokinetic model for dermal absorption of organic chemicals by fish".
Scientific and Technological Achievement Award, U.S. EPA, 1995, "3-Dimensional visualization of physiologically-based kinetic model outputs".
Scientific and Technological Achievement Award, U.S. EPA, 1995, "Use of physiologically-based models in a mechanistic approach to aquatic toxicology".
Scientific and Technological Achievement Award, U.S. EPA, 1995, "Bioenergetics based model for accumulation of polychlorinated biphenyls by nestling tree swallows, *Tachycineta bicolor*".
Scientific and Technological Achievement Award, U.S. EPA, 1991, "A physiologically based toxicokinetic model for the uptake and disposition of waterborne organic chemicals in fish".

INVITED LECTURES/SYMPOSIA

Integrated Toxicology Program, Duke University, Durham, NC, February, 2006, "Use of on-line injection microdialysis to measure the in vivo rate of phenol glucuronidation in unanesthetized rainbow trout".
USGS, Upper Mississippi Sciences Center, La Crosse, WI, January, 2006, "Modeled effects of metabolism on

chemical bioaccumulation in fish”.

Environmental Sciences Department, University of California - Riverside, Riverside, CA, March, 2005, “In vitro-in vivo extrapolation of hepatic metabolism data for fish”.

Biology Department, University of Minnesota, Duluth, MN, 2003, “Use of microdialysis sampling methods to determine in vivo rates of metabolic biotransformation in fish.”

American Chemical Society Agrochemical Division Symposium on Xenobiotic Metabolism in Fish, Dallas, TX, 1996, “Recent advances in the development and use of physiologically based toxicokinetic models for fish”.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Workshop on the Use of In Vitro Test Systems to Support Bioaccumulation Assessments for Fish, San Diego, CA,

March, 2006. Sponsored by ILSI-HESI.

Workshop on Chemical Bioaccumulation in Aquatic Life, Cincinnati, OH, April, 2005. Sponsored by The Proctor and

Gamble Company.

Workshop on Internal Exposure, Monte Verita, Switzerland, August, 2004. Sponsored by a consortium of European Universities and private sector interests.

Workshop on the Use of Toxicokinetic Models in Risk Assessment, The Netherlands, February, 2000. Sponsored by Opdenkamp Adviesgroep.

SETAC Pellston Conference, Reevaluation of the State of the Science for Water Quality Criteria Development, Fairmont Hot Springs, Butte, MT, 1998.

Workshop on Paradigms of Metal Bioaccumulation in Aquatic Ecosystems, San Francisco, CA, 1997. Co-sponsored by the Wisconsin Department of Natural Resources and the Electric Power Research Institute.

SETAC Pellston Conference, Reproductive and Developmental Effects of Contaminants in Oviparous Vertebrates: Mechanisms, Ecological Consequences, and Assessments of Risk, Fairmont Hot Springs, Butte, MT, 1997.

Wildlife/Mercury Workshop, Fairfax, VA, 1996. Co-sponsored by the Wisconsin Department of Natural Resources and the Electric Power Research Institute.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Colloquium on the Use of Japanese Medaka in Risk Assessment Processes, Duluth, MN, 2002. Sponsored by the U.S. EPA Risk Assessment Forum.

5th NHEEL Workshop on the Use of Indicators in Health and Ecological Risk Assessment, Research Triangle Park, NC, 2000. Co-Chair of session on the use of indicators in risk assessments for persistent, bioaccumulative toxicants.

NHEERL Disinfection Byproducts Research Planning Workshop, Duluth, MN, 1999.

NHEERL Wildlife Research Planning Workshop, Research Triangle Park, NC, 1999.

National Wildlife Criteria Methodologies Meeting, Charlottesville, VA, 1992. Co-sponsored by the Office of Water and Office of Science and Technology.

PUBLICATIONS

Nichols, J.W., Schultz, I.R., and Fitzsimmons, P.N. 2006. *In vitro-in vivo* extrapolation of hepatic metabolism data for fish: I. A review of methods and strategy for incorporating intrinsic clearance estimates into chemical

kinetic models. *Aquat. Toxicol.*, 78:74-90.

Nichols, J.W., Echols, K.R., Tillitt, D.E., Secord, A.L., and McCarty, J.P. 2004. Bioenergetics-based modeling of individual PCB congeners in nestling tree swallows from two contaminated sites on the upper Hudson River, NY. *Environ. Sci. Technol.*, 38:6234-6239.

Echols, K.R., Tillitt, D.E., **Nichols, J.W.**, Secord, A.L., and McCarty, J.P. 2004. Bioaccumulation of PCB congeners in nestling tree swallows (*Tachycineta bicolor*) on the Hudson River, NY. Concentrations, patterns and accumulation rates. *Environ. Sci. Technol.*, 38:6240-6246.

- Ankley, G.T., Kuehl, D.W., Kahl, M.D., Jensen, K.M., Butterworth, B.C., and **Nichols, J.W.** 2004. Partial-life cycle toxicity and bioconcentration modeling of perfluorooctanesulfonate (PFOS) in the northern leopard frog (*Rana pipiens*). *Environ. Toxicol. Chem.*, 23:2745-2755..
- Nichols, J.W.** P.N. Fitzsimmons, F.W. Whiteman, T.D. Dawson, L. Babeu, and J. Juenemann. 2004. A physiologically based toxicokinetic model for dietary uptake of hydrophobic organic compounds by fish. I. Feeding studies with 2,2',5,5'-tetrachlorobiphenyl. *Toxicol. Sci.*, 77:206-218.
- Nichols, J.W.** P.N. Fitzsimmons, and F.W. Whiteman. 2004. A physiologically based toxicokinetic model for dietary uptake of hydrophobic organic compounds by fish. II. Simulation of chronic dosing scenarios. *Toxicol. Sci.*, 77:219-229.
- Hornung, M., P. Cook, K. Flynn, D. Lothenbach, R. Johnson, and **J. Nichols**. 2003. Use of multi-photon laser-scanning microscopy to describe the distribution of xenobiotic chemicals in fish early life stages. *Aquat. Toxicol.*, 67:1-11.
- Nichols, J.W.**, P.N. Fitzsimmons, and F.W. Whiteman. 2001. Dietary uptake kinetics of 2,2',5,5'-tetrachlorobiphenyl in rainbow trout. *Drug Metab.Disposit.*, 29:1013-1022.
- Fitzsimmons, P.N., **J.W. Nichols**, J.D. Fernandez, A.D. Hoffman, and B.C. Butterworth. 2001. Branchial elimination of superhydrophobic organic chemicals by fish. *Aquat. Toxicol.*, 55:23-34.
- Nichols, J.**, S. Bradbury, and J. Swartout. 1999. Derivation of wildlife values for mercury. *J. Toxicol. Environ. Health, Part B, Reviews*, 2:325-355..
- Nichols, J.W.**, K.M. Jensen, J.E. Tietge, and R.D. Johnson. 1998. A physiologically based toxicokinetic model for maternal transfer of 2,3,7,8-tetrachlorodibenzo-p-dioxin in brook trout (*Salvelinus fontinalis*). *Environ. Toxicol. Chem.*, 17:2422-2434.
- Tietge, J.E., R.D. Johnson, K.M. Jensen, P.M. Cook, G.E. Elonen, J.D. Fernandez, G.W. Holcombe, D.L. Lothenbach, and **J.W. Nichols**. 1998. Reproductive and toxicological effects in brook trout following a dietary exposure to 2,3,7,8-TCDD. *Environ. Toxicol. Chem.*, 17:2395-2407.

BIOGRAPHICAL SKETCH

NAME: David M. Olszyk

POSITION TITLE: Ecologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Wisconsin, Milwaukee	B.S.	1973	Zoology
University of Wisconsin, Madison	M.S.	1975	Horticulture
University of Wisconsin, Madison	Ph.D.	1979	Horticulture and Botany

PROFESSIONAL EXPERIENCE

1989- to present, Ecologist, EPA, NHEERL, Western Ecology Division
1989: Associate Research Plant Physiologist, Statewide Air Pollution Research Center, Univ. of CA, Riverside
1983-1989: Asst. Research Plant Physiologist, Statewide Air Pollution Research Center, Univ. of CA, Riverside
1985-1988: Head of Plant Sciences Section; Statewide Air Pollution Research Center, Univ. of CA, Riverside
1981-1983: Postdoctoral Fellowship, National Research Council, USEPA, ERL, Corvallis, OR
1981: Instructor, Department of Biology, Edgewood College, Madison, WI
1979-1981: Planning Analyst, Wisconsin Public Service Commission, Bureau of Environmental Review, Madison, WI

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Society of Agronomy
Crop Science Society of America
Weed Science Society of America
Ecological Society of America
Foreign Editor, Japanese Journal of Agricultural Meteorology, 2001-present
Associate Editor, Agriculture, Ecosystems and Environment, 1998-present
Editorial Board, Environmental Bioindicators, 2005-present
Editorial Board, Tree Physiology, 2004-present
Associate Editor, Journal of Environmental Quality, 1986-91, 1995-1997

SELECTED AWARDS AND HONORS

Bronze medal, secondary effects of ozone, 2004; NHEERL Goal 4 Award: Science Integration-InterDivisional/Laboratory Research, 2005

INVITED LECTURES/SYMPOSIA

Research to Determine Effects of Herbicide Drift on Non-target Plants: New Tools", National Pesticide Regulators Meeting, St. Petersburg, FL, 2005
Improved Methods to Determine Effects of Herbicide Drift on Non-target Plants: New Tools. Spring 2005 Western Region Pesticide Meeting. Las Vegas, NV, 2005
Foliar N response of Ponderosa pine seedlings to elevated CO₂ and O₃. 6th Intl. Symposium on Plant Responses to Air Pollution and Global Changes, Tsukuba, Japan, 2004
Effects of Carbon Dioxide and Ozone on Nitrogen Retranslocation in Ponderosa Pine Needles. 5th Intl. Symposium on Responses of Plant Metabolism to Air Pollution Pulawy, Poland, 2001

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Courtesy Faculty Member and member of Graduate Faculty, Crop and Soil Science Dept., Oregon State Univ.,
1989-present
Adjunct Faculty Member, Dept. of Biology, Univ. of Portland (Oregon), August, 1996-present

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Acting Chief, Risk Characterization Branch, WED, NHEERL, 8/2006 to present, Project Leader, WED, 1989 to 2006,
WED representative on ORD and NHEERL working groups dealing with computational toxicology, air toxics, and
climate change, and strategic planning.

PUBLICATIONS

- Tingey D.T., M.J. Johnson, E.H. Lee, C. Wise, R. Waschmann, D.M. Olszyk, L.S. Watrud, and K. Donegan. (In press). Effects of Elevated CO₂ and O₃ on Soil Respiration under Ponderosa Pine. *Soil Biol. Biochem.*
- Pfleeger, T.G., D. Olszyk, C. Burdick, G. King, J. Kern and J. Fletcher. (In press). Using GIS to Identify Areas and Species with Potential for Off-target Pesticide Exposure. *SETAC J. Environ. Tox. Chem.*
- Olszyk, D.M., D.T. Tingey, W.E. Hogsett and E.H. Lee. 2006. Effects of carbon dioxide and ozone on leaf abscission, nitrogen concentration and nitrogen resorption in *Pinus Ponderosa*. In *Plant Responses to Air Pollution and Global Change*. K. Omasa, I. Nouchi and L.J. De Kok (Eds.). Springer, Tokyo
- Lee, E.H, C.A. Burdick and D.M. Olszyk. 2005. GIS-Based Risk Assessment of Pesticide Drift: Case Study: Fresno County, California. US EPA, NHEERL, Report.
- Olszyk, D., M. Apple, B. Gartner, R. Spicer, C. Wise, E. Buckner, A. Benson-Scott and D. Tingey. 2005. Xeromorphy increases for shoots of *Pseudotsuga menziesii* (Mirb.) Franco seedlings with exposure to elevated temperature but not elevated CO₂. *Trees Struct. Func.*
- Beedlow, P.A., D.T. Tingey, D.L., W.E. Hogsett and D.M. Olszyk. 2004. Rising atmospheric CO₂ and carbon sequestration in forests. *Front. Ecol.*
- Olszyk, D., C. Burdick, T. Pfleeger, E.H. Lee and L.S. Watrud. 2004. Assessing the risks to non-target Plants from herbicides. *J. Agric. Meteorol. (Japan)*.
- Tausz, M., S. Monschein, D. Olszyk and D. Tingey. 2004. Combined effects of CO₂ and O₃ on antioxidative and photoprotective defense systems in needles of ponderosa pine grown in a mesocosm. *Biol. Plant.*
- Hobbie, E.A., M.G. Johnson, P.T. Rygielwicz, D.T. Tingey and D.M. Olszyk. 2004. Isotopic estimates of new carbon inputs into litter and soils in a four-year climate change experiment with Douglas-fir. *Plant and Soil.*
- Lewis, J.D., M. Lucash, D.M. Olszyk and D.T. Tingey. 2004. Relationships between leaf nitrogen concentration and photosynthetic responses of Douglas-fir seedlings to elevated carbon dioxide and temperature. *New Phytologist.*
- Olszyk, D., M. Johnson, D. Tingey, G. King, M. Storm and M. Plocher. 2003. Effects of Carbon Dioxide and Ozone on Growth and Biomass Allocation in *Pinus ponderosa*. *Ecology (Bratislava)*.
- Olszyk, D.M., M.G. Johnson, D.T. Tingey, P.T. Rygielwicz, C. Wise, E. VanEss, A. Benson, M.J. Storm, and R. King. 2003. Whole seedling biomass allocation, leaf area and tissue chemistry for Douglas-fir exposed to elevated CO₂ and temperature for four years. *Can. J. For. Res.*
- Snow, M.D., R.D. Bard, D.M. Olszyk, L.M. Minster, A.N. Hager, and D. T. Tingey. 2003. Monoterpene levels in needles of Douglas fir exposed to elevated CO₂ and temperature. *Physiologia Plantarum* 117:352-358.
- Tingey, D.T., R.B. McKane, D.M. Olszyk, M.G. Johnson, P.T. Rygielwicz, and E. H. Lee. 2003. Elevated CO₂ and temperature alter nitrogen allocation in Douglas-fir. *Global Change Biology* 9:1038-1050.
- Olszyk, D., D. Tingey, C. Wise, and E. Davis. 2002. CO₂ and O₃ alter photosynthesis and water vapor exchange for *Pinus ponderosa* needles. *Phyton* 42:121-134.
- Hobbie, E.A., J. Gregg, D.M. Olszyk, P.T. Rygielwicz, and D.T. Tingey. 2002. Effects of Climate Change on Labile and Structural Carbon in Douglas-fir Needles as Estimated by delta 13C and Carea measurements. *Global Change Biology* 8:1-13.
- Lewis, J.D., M. Lucash, D.M. Olszyk, and D.T. Tingey. 2002. Stomatal Responses of Douglas-fir Seedlings to

- Elevated Carbon Dioxide and Temperature During the Third and Fourth Years of Exposure. *Plant Cell Environment* 25:1411-1421.
- Olszyk, D.M., M. G. Johnson, D. L. Phillips, R. J. Seidler, D. T. Tingey, and L. S. Watrud. 2001. Interactive effects of CO₂ and O₃ on a ponderosa pine plant/litter/soil mesocosm. *Environmental Pollution* 115:447-462.
- Hobbie, E.A., D.M. Olszyk, P.T. Rygielwicz, D.T. Tingey and M.G. Johnson. 2001. Foliar nitrogen concentrations and natural abundance of ¹⁵N suggest nitrogen allocation patterns of Douglas-fir and mycorrhizal fungi during development in elevated carbon dioxide concentration and temperature. *Tree Physiology* 21:1113-1122.
- Olszyk, D.M., D.T. Tingey, Lidia Watrud, R. Seidler, and C. Andersen. 2000. Interactive effects of O₃ and CO₂: implications for terrestrial ecosystems. Pages 97-136 in S.N. Singh, editor. *Trace Gas Emissions and Plants*. Kluwer Academic, Amsterdam.
- Olszyk, D.M., H.G.S. Centano, L.H. Ziska, J.S.Kern, and R.B. Matthews. 1999. Global Change, Rice Productivity and Methane Emissions: Comparison of Predicted and Experimental Results. *Agric. For. Meteorology* 9:87-101.
- Olszyk, D.M., C. Wise, E. VanEss, and D. Tingey, 1998. Elevated temperature but not elevated CO₂ affects stem diameter and height of Douglas-fir seedlings: results over three growing seasons. *Can. J. For. Res.* 28:1046-1054.

NARRATIVE

My research goals are: 1) to develop techniques to better define the risks to vegetation from environmental stress, particularly herbicide drift and chemical effects on non-target plants; and 2) to develop a deeper understanding of the fundamental physiological mechanisms by which vegetation respond to environmental stresses. At present I am focusing on development of molecular methods to detect/predict the effects of herbicides on non-target plants, field methods to detect ecological responses of plant communities to herbicides, spatial analysis techniques to evaluate effects of pesticides over regions, and development of techniques to determine effects of nanomaterials on plants and plant communities.

BIOGRAPHICAL SKETCH

NAME: Edward F. Orlando

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Florida, Gainesville, FL	BS	1987	Construction
University of Florida, Gainesville, FL	MS	1997	Management
University of Florida, Gainesville, FL	PhD	2001	Zoology Zoology

PROFESSIONAL EXPERIENCE

2005 - present Assistant Professor, Biological Sciences Department, Florida Atlantic U., Harbor Branch Oceanographic Institution Campus, 5900 US 1 N., Ft. Pierce, FL 34946

2000 – 2005 Assistant Professor, Biology Department, St. Mary's College of Maryland, 18952 E. Fisher Rd. St. Mary's City, MD 20686

1997 – 2000 Research Associate, Zoology Department, U. of Florida, Gainesville FL 32611

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Association for the Advancement of Science, Society of Environmental Toxicology and Chemistry, Society of Integrative and Comparative Biology, and the Society for the Study of Reproduction.

INVITED LECTURES/SYMPOSIA

(10 from total of 21)

1. Forestry and Natural Resources Department, Purdue U., W. Lafayette, IN (2006)
2. Interdisciplinary Reproductive Biology Group, U. Florida, Gainesville, FL (2006)
3. Ocean Science Lecture Series, Harbor Branch Oceanographic Institution (HBOI), Ft. Pierce, FL (2006).
4. Enviro-Vet Summer Institute, HBOI, Ft. Pierce, FL (2006).
5. Hood College Coastal Studies Semester Traveling Class, HBOI, Ft. Pierce, FL (2006).
6. Chesapeake Biological Laboratory, U. Maryland, Solomons Island, MD (2005)
7. Department of Biology, U. South Florida, Tampa, FL (2005)
8. Biology Department Colloquium, Hood College, Frederick, MD (2004)
9. Gordon Conference on Endocrine Disruptors, Colby Sawyer College, NH (2004)
10. Chesapeake Biological Laboratory, U. Maryland, Solomons Island, MD (2004)

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

2006 USDA-CREES, Mid-Atlantic Regional Water Quality Program (Nov 2006), Invited panel member for the program, "Endocrine Disruptors, What do We Know and Why We Should be Concerned".

2002 Co-chair for a paper session at the II International Symposium on Livebearing Fishes (Queretaro, Mexico).

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

2004 - present USEPA Endocrine Disruptor Methods Validation Advisory Committee

2005 USEPA Complex Mixtures STAR Grant Pier Review Panel (PRP)

2006 USEPA Fate and Effects of Hormones from CAFOs STAR Grant PRP (declined due to conflict of interest)

PUBLICATIONS

(34 total, 14 primary authorship)

Journal Article

1. J Burger, C Fossi, P McClellan-Green, and EF Orlando. Methodologies, bioindicators, and biomarkers for assessing gender-related differences in wildlife exposed to environmental chemicals. *Environmental Research* (Accepted Aug 20, 2006, DOI/10.1016/JER.2006.08.002)
2. EF Orlando and LJ Guillette, Jr. Sexual dimorphic responses in wildlife exposed to endocrine disrupting chemicals. *Environmental Research* (Accepted Jun 9, 2006, DOI/10.1016/JER.2006.06.002).
3. EF Orlando, GA Binczik, J Gates, LE Gray Jr., M Horton, AS Kolok, C Lambright, and LJ Guillette, Jr. Endocrine disrupting effects of cattle feedlot effluent on a sentinel species, the fathead minnow. *Environmental Health Perspectives* 112: 353-358 (2004).
4. AM Soto, JM Calabro, NV Prechtel, AY Yau, EF Orlando, A Daxenberger, AS Kolok, LJ Guillette, Jr., BL Bizec, IG Lange, and C Sonnenschein. Androgenic and estrogenic activity of cattle feedlot effluent receiving water bodies of eastern Nebraska, USA. *Environmental Health Perspectives* 112: 346-352 (2004).
5. J Burger, EF Orlando, M Gochfeld, and LJ Guillette, Jr. Metal levels in tissues of Florida gar, *Lepisosteus platyrhincus*, from Lake Okeechobee, Florida USA. *Environmental Monitoring and Assessment* 90(1) 187-201 (2004).
6. EF Orlando, GA Binczik, L Ford, P Thomas, and LJ Guillette, Jr. Reproductive seasonality of the male Florida gar, *Lepisosteus platyrhincus*. *General and Comparative Endocrinology* 131(3) 365-371 (2003).
7. EJ Durhan, C Lambright, V Wilson, BC Butterworth, DW Kuehl, EF Orlando, LJ Guillette, Jr., LE Gray, Jr., and GT Ankley. Evaluation of androstenedione as an androgenic component of river water downstream of a pulp and paper mill effluent. *Environmental Toxicology and Chemistry* 21(9):1973-1976 (2002).
8. EF Orlando, WP Davis, LJ Guillette, Jr. Aromatase activity in the ovary and brain of the mosquitofish, *Gambusia holbrooki*, exposed to paper mill effluent. *Environmental Health Perspectives* 110 (Supplement 3): 429-433 (2002).
9. EF Orlando, GA Binczik, KJ Kroll, LJ Guillette, Jr. The contaminant-associated stress response and its relationship to plasma stress and sex steroid concentrations in the Florida gar, *Lepisosteus platyrhincus*. *Environmental Sciences* 9 (4): 1-14 (2002).
10. L Parks, C Lambright, EF Orlando, LJ Guillette, Jr., GT Ankley, and LE Gray, Jr. Masculinization of female mosquitofish in kraft mill effluent-contaminated Fenholloway River water is associated with androgen receptor agonist activity. *Toxicological Sciences*, 62 (2):257-67 (2001).
11. ME McMaster, JJ Jardine, G Ankley, WH Benson, M Greeley, T Gross, LJ Guillette, Jr., D MacLachy, EF Orlando, G Van Der Kraak, and KR Munkittrick. An interlaboratory study on the use of steroid hormones in examining endocrine disruption. *Environmental Toxicology and Chemistry* 20 (9):2081-7 (2001).
12. LE Gray, Jr., J Ostby, J Furr, CJ Wolf, C Lambright, L Parks, D Veeramachaneni, V Wilson, M Price, A Hotchkiss, EF Orlando, LJ Guillette, Jr. Effects of environmental antiandrogens on reproductive development in experimental animals. *Human Reproduction Update*, May-Jun; 7 (3): 248-64 (2001).
13. EF Orlando and LJ Guillette, Jr. A reexamination of variation associated with environmentally stressed organisms. *Human Reproduction Update*, May-Jun; 7(3):265-72 (2001).
14. LC Folmar, ND Denslow, K Kroll, EF Orlando, J Enblom, J Marcino, C Metcalfe and LJ Guillette, Jr. Altered serum sex steroids and vitellogenin induction in walleye (*Stizostedion vitreum*) collected near a metropolitan sewage treatment plant. *Archives of Environmental Contamination and Toxicology*, Apr 40(3):392-8 (2001).
15. LJ Guillette, Jr., DA Crain, A Galle, MP Gunderson, SAE Kools, MR Milnes, EF Orlando, AA Rooney, and AR Woodward. Alligators and endocrine disrupting contaminants: a current perspective. *American Zoologist*, 40: 438-452 (2000).
16. J Burger, AA Rooney, M Gochfeld, AR Woodward, EF Orlando, A Galle, and LJ Guillette, Jr. Metals and metalloids in tissues of American alligators from three Florida lakes. *Archives of Environmental Contaminants and Toxicology*, 38 (4) 501-508 (2000).
17. EF Orlando, ND Denslow, LC Folmar, and LJ Guillette, Jr. A comparison of the reproductive physiology of largemouth bass, *Micropterus salmoides*, collected from the Escambia and Blackwater Rivers in Florida. *Environmental Health Perspectives* 107(3) 199-204 (1999).

Book Chapters and Conference Proceedings

1. DL Villeneuve, EF Orlando, KJ Greene, LS Blake, KM Jensen, MD Kahl, EA Makynen, EJ Durhan, AL Linnun, AL Miracle, and GT Ankley. Quantitative RT-PCR assays for fathead minnow StAR and CYP11A and effects of ketoconazole on their expression in vivo. *The Toxicologist* 90(1) 320 (2006).
2. EF Orlando, WP Davis, TM Edwards, DF Sulkowski, G Toft, and LJ Guillette, Jr. Mosquitofish as sentinels of exposure to environmental androgens and estrogens. In: *Viviparous Fishes. Genetics, Ecology, and Conservation*, pp. 435 - 453, New Life Publications, Inc., Homestead, FL (2005).
3. EF Orlando and LJ Guillette, Jr. The effects of endocrine-disrupting chemicals on the reproduction and development of wildlife. In: *The Handbook of Environmental Chemistry (Ed-in-Chief: O. Hutzinger) Volume: Endocrine Disrupters in the Environment (Vol.Ed.: M Metzler)*, pp. 249-270, Springer-Verlag, (2002).

NARRATIVE

My lab integrates molecular, endocrinological, and morphological endpoints to further our understanding of the environment – genome interaction and its effect on reproduction and development. Current research includes the environmental and genomic regulation of sex determination and differentiation and the effects of endocrine disrupting chemicals on the hypothalamic-pituitary-gonadal axis regulation of the reproductive physiology of fishes.

BIOGRAPHICAL SKETCH

NAME: Stephanie Padilla

POSITION TITLE: Research Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Massachusettes, Amherst, MA	B.S. (with High Honors)	1966-1968	Food Science
North Carolina State University, Raleigh, NC		1973	
University of North Carolina, School of Medicine	Ph.D.	1979	Biochemistry

PROFESSIONAL EXPERIENCE

2003-present: Research Toxicologist, Cellular and Molecular Toxicology Branch, NTD, HERL/NHEERL, ORD, USEPA, RTP, NC

August 2000-March 2001: Acting Director, NTD, NHEERL, ORD, US EPA, RTP, NC

1997-2003: Chief, Cellular and Molecular Toxicology Branch, NTD, NHEERL, ORD, USEPA, RTP, NC

1984-1997: Research Toxicologist, Cellular and Molecular Toxicology Branch, NTD, HERL/NHEERL, ORD, USEPA, RTP, NC

1981-1984: Project Scientist, Northrop Services, NTD, HERL, ORD, USEPA, RTP, NC.

SELECTED AWARDS AND HONORS

EPA Bronze Medal for Commendable Service-1991

Scientific and Technology Achievement Award, 1992, Level II

Scientific and Technology Achievement Award, 1993, Level III

Scientific and Technology Achievement Award, 1993, Honorable Mention

Scientific and Technology Achievement Award, 1998, Level III

EPA Silver Medal for Commendable Service-1999

EPA Bronze Medal for Commendable Service-2003

INVITED LECTURES/SYMPOSIA

Presentation before the June 26-27, 2002 meeting of the FIFRA Scientific Advisory Panel, Arlington, Va. for Determination of the Appropriate FQPA Safety Factor(s) in the Organophosphorous Pesticide Cumulative Risk Assessment : Susceptibility and Sensitivity to the Common Mechanism, Acetylcholinesterase Inhibition.

Presentation was entitled "Age Dependent Sensitivity and Susceptibility."

ORD/OPPTS Seminar Series Presentation, "Age-Related Sensitivity to Pesticides: Case Study with the Organophosphate Insecticides. July 10, 2002

Anti-Terrorism Workshop, US Civilian Research and Development Foundation for the Independent States of the Former Soviet Union, " Correlating in vivo Sensitivity to Organophosphate Toxicity with in vitro Detoxification Levels" July 31, 2002, Arlington, Virginia.

VIII International Meeting on Cholinesterases. "Age-Related Sensitivity to Organophosphorus Pesticides," Sept. 26-30, 2004. Perugia, Italy.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Member, Editorial Board, Neurotoxicology. 1995-present.

Regular peer reviewer for the Department of Defense grant proposals, 1993 - present.
Testified before the House of Representatives, Washington, DC, Investigative Hearings on the Gulf War Illness, October, 1997
Project Officer and Foreign Collaborator for ISTC Project: "Development of Biosensor Methods for the Analysis of Organophosphorus Compounds Inducing Acute or Delayed Neurotoxicity. Research Center of Molecular Diagnostics and Therapy. Moscow, Russia. 2000-2002.
Member, Scientific Advisory Committee for the Center for Environmental Health Sciences, University of Montana, Missoula, Montana. 2001 -2005.
Adjunct Professor, Curriculum in Toxicology, University of North Carolina at Chapel Hill, Chapel Hill, NC. 2001-present.
Member, Review Board for Toxicology Training Grant, Department of Toxicology, University of Michigan, Ann Arbor, Michigan. 2003 - present

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Member of the International Life Sciences Institute Task Force on Systemic Toxicity, 2003 - present.
Methyl Carbamate Team, US EPA, Office of Pesticide Programs. 2003 - present.

PUBLICATIONS

(2001-2005)

Buzinkov, G.A., Nikitina, L.A., Bezuglov, V.V., Lauder, J.M., Padilla, S., and T.Slotkin. An invertebrate model of the developmental neurotoxicity of insecticides: Effects of chlorpyrifos and Dieldrin in sea urchin embryos and larvae. *Environmental Health Perspectives*, 109:651-661, 2001
Dorman, D.C., Allen, S.L., Byczkowski, J.Z., Claudio, L., Fisher, J.E., Jr., Fisher, J.W., Harry, G., Makris, S.L., Padilla, S., Sultatos, L.G., and Mileson, B.E. Methods to identify and characterize developmental neurotoxicity for human health risk assessment. iii: Pharmacokinetic and pharmacodynamic considerations. *Environmental Health Perspectives*, 109, Suppl 1: 101-111, 2001.
Chanda, S.M., Lassiter, T.L., Moser, V.C., Barone, S., Jr., and S. Padilla. Tissue carboxylesterases and chlorpyrifos toxicity in the developing rat. *Human and Ecological Risk Assessment*, 8:75-90, 2002.
Qiao, D., Seidler, F.J., Padilla, S., and T.A. Slotkin. Developmental neurotoxicity of chlorpyrifos: What is the vulnerable period? *Environ Health Perspect*. 110:1097-10103, 2002.
Lassiter, T.L., Marshall, R.S., Jackson, L.C., Hunter, D.L., Vu, J.T. and S. Padilla. Automated measurement of acetylcholinesterase activity in rat peripheral tissues. *Toxicol*. 186:241-253, 2003.
Padilla, S., Sung, H-J, and V.C. Moser. Further assessment of an in vitro screen that may help identify organophosphorus pesticides that are more acutely toxic to the young. *J. Toxicol. Environ. Health*, 64:1477-1489, 2004.
Moser, V.C., Phillips, P.M., McDaniel, K.L., Marshall, R.S., Hunter, D.L. and Padilla, S. (2005) Neurobehavioral effects of chronic dietary and repeated high-level acute exposure to chlorpyrifos in rats. In press, *Toxicol. Sci*.
Padilla, S., Marshall, R.S., Hunter, D.H., Oxendine, S., Moser, V.C., Southerland, S.B., and R.B. Mailman. (2005). Neurochemical effects of chronic dietary and repeated high-level acute exposure to chlorpyrifos in rats. In press, *Toxicol. Sci*.
Anand, S.S., Bruckner, J.V., Haines, W.T., Muralidhara, S., Fisher, J.W., and S. Padilla (2005). Characterization of deltamethrin metabolism by rat plasma and liver metabolism. In press, *Toxicol. Appl. Pharmacol*.
Claus Henn, B., McMaster, S., and S. Padilla. (2005). Measuring cholinesterase activity in human saliva. In press, *J. Toxicol. Environ. Health*.
Cumulative Effects of Organophosphorus or Carbamate Pesticides. S. Padilla, in *Toxicology of Organophosphate and Carbamate Pesticides*, Elsevier Press, in press.

BIOGRAPHICAL SKETCH

NAME: Ronald D. Parker

POSITION TITLE: Senior Environmental Engineer

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Iowa State University	B.S.	1971	Engineering Operations
Iowa State University	B.S.	1971	Biology
Iowa State University	M.S.	1978	Civil/Environmental Engineering
University of Arizona	Ph.D.	1991	Watershed Hydrology

PROFESSIONAL EXPERIENCE

1997 - Present: Senior Environmental Engineer, U.S. Environmental Protection Agency (USEPA), Office of Pesticide Programs (OPP), Washington, D.C.

Conducted large number of pesticide aquatic ecological and drinking water exposure/risk assessments: Served as Chair of Water Quality Tech Team and member of Science Policy Panel which advises the OPP Environmental Fate and Effects Division on pesticide exposure issues, Technical advisor to OPP international division to create an international training and risk assessment module for use by developing countries; Developed several risk assessment computer programs used by the USEPA Office of Pesticide Programs, pesticide manufacturers, and available on the USEPA website; Work regularly with other government agencies and non-governmental agencies (U.S. and international) on pesticide risk issues.

2001 - 2002: Senior Environmental Engineer, U.S. Environmental Protection Agency on a detail to the United Nation's Food and Agricultural Organization (FAO), Rome, Italy.

Worked with FAO Plant Protection Division (AGPP) as visiting scientist; Led effort with Organization for Economic Cooperation and Development to develop pesticide risk assessment and risk management training materials for developing countries; Updated FAO's Environmental Fate Guidelines and Environmental Criteria for Risk Assessment; Served on team to conduct risk assessment for use of bio-pesticides for locust control; Visited developing countries to conduct pesticide risk

1991 - 1997: Environmental Engineer, U.S. Environmental Protection Agency, Office of Pesticide Programs, Washington, D.C.

Developed methodology for exposure/risk assessment for pesticides in surface water utilizing computer modeling and field studies; Managed numerous pesticide risk assessments; Conducted pesticide exposure assessment seminars; Worked with other US government agencies to produce educational materials for pesticide users to mitigate pesticide risk to human health and the environment.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Member Chi Epsilon – National Civil Engineering Honorary Society
Member IUPAC Division of Chemistry and the Environment
Member Soil and Water Conservation Society

SELECTED AWARDS AND HONORS

1. EPA Office of Pesticide Programs Peer Excellence Award
2. EPA Office of Pesticide Programs Bronze Medal – Chlorpyrifos Assessment Team
3. EPA Office of Pesticide Programs Bronze Medal – Corn Cluster Assessment Team
4. EPA Silver Medal Award: Ecological Committee on FIFRA Risk Assessment Methods (ECOFRAM) Development Team

INVITED LECTURES/SYMPOSIA

(Four of 5 were in the last 5 years)

“Development of Simplified Methods and Tools for Ecological Risk Assessment of Pesticides, Parker, R.D. in Proceedings: International Workshop on Crop Protection Chemistry in Latin America: Harmonized Approaches for Environmental Assessment and Regulation, Pages 97-98, International Union of Pure and Applied Chemistry Conference, San Jose, Costa Rica, February 2005.

“FAO Simplified Pesticide Ecological Risk Assessment Methodology”, Parker, R.D. and Vaagt, Gero, in Harmonization of Data Requirements and Evaluation: Environmental Chemistry, Toxicology / Ecotoxicology, Risk Assessment, and Regulation, Page 201-206, IUPAC Seoul, Korea, October 2004.

“Use of EXPRESS Pesticide Simulation Shell for Pesticide Aquatic Exposure Assessment,” Università Cattolica del Sacro Cuore, Piacenza, Italy, August 2002

“Mathematical Modeling of Aquatic Pesticide Exposure”, Simposio De Toxicologia, Agricultura E Preservacao Da Qualidade Da Agua, Ribeirao Preto, Sao Paulo, Brazil, March 1999.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

1998-Present – Member of Watershed Regressions for Pesticides development team composed of scientists from USGS, USDA, USEPA, pesticide industry, American Water Works Association

2002-Present - International Union of Pure and Applied Chemistry (IUPAC), Work with international group of scientists on development of Risk Assessment and Training Module for developing countries.

November 2004 - San Salvador, El Salvador, “Taller Sobre Riesgo Ecologico Del Uso De Pesticidas”, Training and field testing of EPA’s Risk Assessment and Training Module with six Central American countries in pesticide risk assessment / risk management; sponsored by Comision Centroamericana de Ambiente y Desarrollo (CCAD).

July 2002 - Accra, Ghana - Training of pesticide risk assessment and risk management for toxic chemicals staff of Ghanaian Environmental Protection Agency, funded by UN Institute for Training and Research. (UNITAR).

May 2002 - San Jose, Costa Rica, “Workshop on Simplified Exposure Assessment for Pesticide Registration”, two week training session for seven Central and South American countries, Centro de Investigación en Contaminación Ambiental (CICA) – Universidad de Costa Rica.

March 2002 - Dakar, Senegal, Trained staff of Fondation Locustox Ceres, Programme des Gestion des Risques des Pesticides Dans l’agriculture Dans la Vallee du Fleuve Senegal in pesticide risk assessment/ risk management. Investigated pesticide use and water contamination in Senegal River Valley.

March-April 1993, US Office of Foreign Disaster Assistance - Served as drinking water / livestock water expert as a member of drought assistance team in southern African drought; Visited seven countries in southern Africa to develop interventions to mitigate consequences of drought.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

- 1) Have led or made presentations to eight FIFRA Science Advisory Panel public meetings
- 2) Lead EPA, USDA, industry team in development of USDA/EPA publication “Conservation Buffers to Reduce Pesticide Risk”
- 3) Founded and led team to develop the USGS SPARROW/WARP technology for estimation of pesticide exposure in surface water
- 4) Founded and led group to develop user-friendly shell for aquatic exposure assessments using EPA PRZM and EXAMS models

5) Founded and led group to develop the GENEEC and FIRST pesticide aquatic exposure assessment screening models

PUBLICATIONS

Evaluation of Three Watershed-scale Pesticide Environmental Transport and Fate Models, Ronald Parker, J.G. Arnold, Michael Barrett, Lawrence Burns, Lee Carrubba, S.L. Neitsch, N.J. Snyder, R. Srinivasan: Journal of American Water Resources Association, *in press*.

“Development of GENEEC for Estimation of Pesticide Exposure”, Parker, R.D., H.P. Nelson and R.D. Jones, in Proceedings, Society of Environmental Toxicology and Chemistry, Houston , 1996.

“GENEEC: A Screening Model for Pesticide Environmental Exposure Assessment”, Parker, R.D., H.P. Nelson and R.D. Jones, The International Symposium on Water Quality Modelling, American Society of Agricultural Engineers, April 1995. Published in 'Water Quality Modeling Proceedings', ASAE, 1995.

Computer Models for Pesticide Risk Assessment: An International Progress Report - USEPA Perspective; Presentation Made to International Union of Pure and Applied Chemistry (IUPAC), Washinton DC, 1994.

Recommendations for Developing Risk Mitigation Strategies for High Risk Pesticides, K.L. Monk, J.W. Holmes, R.D. Jones, R.D. Parker and A. Maciorowski, ACS, Wash DC, August 21-25, 1994.

Risk Mitigation Strategies, K.L. Monk, J.W. Holmes, R.D. Jones, R.D. Parker and A. Maciorowski, Society of Environmental Toxicology and Chemistry (SETAC). Houston, TX 1993.

Use of Variable and Uncertain Data in Characterization of Expected Environmental Concentrations of Pesticides, Parker, R.D., H.P. Nelson and R.D. Jones, in 'Data Reliability and Risk Assessment in Soil Interpretations'; Chapter 10, Soil Science Society of America (SSSA), 1993.

BIOGRAPHICAL SKETCH

NAME: Thomas G. Pfleeger

POSITION TITLE: Research Plant Physiologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
SUNY Syracuse	B.S.	1974	Biological Sciences
Oregon State Univ.	M.S.	1991	Plant Ecology
Oregon State Univ.	Ph.D.	1998	Plant Ecology

PROFESSIONAL EXPERIENCE

1985-1990: Plant Physiologist, USEPA, Corvallis Environmental Research Laboratory

1979-1985: Biological Technician, USEPA, Corvallis Environmental Research Laboratory

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS:

British Ecological Society

Society of Environmental Toxicology and Chemistry

Ecological Society of America

SELECTED AWARDS AND HONORS

EPA Scientific and Technological Achievement Award, 1996 Level I

Environmental Protection Agency Scientific and Technological Achievement Award, 1988 Level III

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Curriculum development on vegetation for the Corvallis School District, Outdoor School (1997- present)

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Steering Committee on Issues of Nontarget Plant Toxicity (1998-present)

PUBLICATIONS

Pfleeger, T.G., D. Olszyk, C. Burdick, G. King, J. Kern and J. Fletcher. (In press). Using GIS to Identify Areas and Species with Potential for Off-target Pesticide Exposure. *J. Environ. Tox. Chem.*

Pfleeger, T.G., M.A. da Luz, and C.C. Mundt. 1999. Lack of synergistic interaction between ozone and wheat leaf rust in wheat swards. *Environ. & Exp. Bot.* 41(3):195-207.

Pfleeger, T.G., C.C. Mundt, and Michelle A. da Luz. 1999. Effects of wheat leaf rust on interactions between wheat and

wild oats planted at various densities and proportions. *Can. J. Bot.* 77:1669-1683.

Pfleeger, T.G. and C.C. Mundt. 1998. Wheat leaf rust severity as affected by plant density and species proportion in simple communities of wheat and wild oats. *Phytopathology* 88:708-714.

Pfleeger, T.G., A. Fong, R. Hayes, H. Ratsch, and C. Wickliff. 1996. Field evaluation of the EPA (Kenaga) nomogram,

A method for estimating wildlife exposure to pesticide residues on plants. *Environ. Tox. & Chem.* 15:534-543.

Fletcher, J.S., T.G. Pfleeger, H.C. Ratsch, and R. Hayes. 1996. Potential impact of low levels of chlorsulfuron and other herbicides on growth and yield of nontarget plants. *Environ. Tox. & Chem.* 15:1189-1196.

Pfleeger, T. and D. Zobel. 1995. Organic pesticide modification of species interactions in annual plant communities. *Ecotoxicology* 4:15-37.

Fletcher, J.S., T.G. Pfleeger, and H.C. Ratsch. 1995. Chlorsulfuron influence on garden pea reproduction. *Physiologia*

- Plantarum 94:261-267.
- Fletcher, J.S., J.E. Nellessen, and T.G. Pflieger. 1994. Literature review and evaluation of the EPA food-chain (Kenaga) nomogram, an instrument for estimating pesticide residues on plants. *Environ. Tox. & Chem.* 13:1383-1391.
- Pflieger, T., H. Ratsch, and R. Shimabuku. 1993. A review of terrestrial plants as biomonitors. Pages 317-330 in J. Gorsuch, J. Dwyer, C. Ingersoll and T. La Point, editors. *Environmental Toxicology and Risk Assessment*, 2nd Vol. ASTM STP 1216. ASTM, Philadelphia.
- Fletcher, J.S., T.G. Pflieger, and H.C. Ratsch. 1993. Potential environmental risks associated with the new sulfonylurea herbicides. *Environ. Sci. Technol.* 27:2250-2252.
- Pflieger, T., J. Fletcher, and H. Ratsch. 1992. Effects of Glean, a sulfonylurea herbicide, on the reproductive biology and fruit set in cherry trees. U.S. Environmental Protection Agency. EPA/600/R-92/020.
- Pflieger, T.G., J.C. McFarlane, R. Sherman, and G. Volk. 1991. A short-term bioassay for whole plant toxicity. Pages 355-364 in J.W. Gorsuch, W.R. Lower, M.A. Lewis and W. Wang, editors, *Plants for Toxicity Assessment*: 2nd vol. ASTM STP 1115. ASTM, Philadelphia.
- McFarlane, C., T. Pflieger, and J. Fletcher. 1990. Effect, uptake and disposition of nitrobenzene in several terrestrial plants. *Environ. Tox. & Chem.* 9:512-520.
- Fletcher, J.S., J.C. McFarlane, T. Pflieger, and C. Wickliff. 1990. Influence of root exposure concentration on the fate of nitrobenzene in soybean. *Chemosphere* 20:513-523.
- McFarlane, C., and T. Pflieger. 1987. Plant exposure chambers for the study of toxic/plant interactions. *J. Environ. Qual.* 16(4):361-371.
- McFarlane, C., T. Pflieger, and J. Fletcher. 1987. Transpiration effect on the uptake and distribution of bromacil, nitrobenzene, and phenol in soybean plants. *J. Environ. Qual.* 16(4):372-376.
- McFarlane, J.C., C. Nolt, C. Wickliff, T. Pflieger, R. Shimabuku, and M. McDowell. 1987. The uptake, distribution and metabolism of four organic chemicals by soybean plants and barley roots. *Environ. Tox. Chem.* 6:847-856.

BIOGRAPHICAL SKETCH

NAME: Sandy Raimondo

POSITION TITLE: Ecologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
The Pennsylvania State University	B.S.	1996	Biology
Marshall University	M.S.	1999	Biology
West Virginia University	Ph.D.	2003	Entomology

PROFESSIONAL EXPERIENCE

6/03 to present. U.S. Environmental Protection Agency. Gulf Breeze, FL. Ecologist.

Quantitative Ecologist working towards integrating toxicological extrapolation models into probabilistic risk assessment.

Develop and validate models to extrapolate toxicity across species and endpoints.

Develop web-based modeling tools for use by EPA Program Offices and risk assessment community.

Develop models projecting the population-level effects of pollutants on estuarine invertebrates based on parameters measured in laboratory experiments and validated with field studies of natural populations from the Gulf of Mexico.

4/03 to 6/03. U.S.D.A. Forest Service, Morgantown, WV. Statistical Analyst.

Analyzed ecological relationships among forest Lepidoptera using a wide range of statistical procedures to develop simulation and empirical food web models.

1/00 to 5/03. West Virginia University, Morgantown, WV. Graduate Research Assistant.

Studied community dynamics of Lepidoptera in central Appalachia: Developed spatio-temporal models of synchronous interactions among generalist predators and multi-species prey complex based on seven-year field study.

Studied the long-term impact of gypsy moth management practices on non-target Lepidoptera species through population models.

Responsible for field component of long-term study of the effects of gypsy moth pesticides on non-target invertebrates. Led and coordinated field crews of up to twelve undergraduate throughout central Appalachia. Coordinated laboratory sorting and insect processing.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Environmental Toxicology and Chemistry, 2004 - present

Society for Integrative and Comparative Biology, 2003 - present

Gamma Sigma Delta Agricultural Honor Society, 2001 – present

Entomological Society of America, 2000 – 2004

Association of Southeastern Biologists, 1998 - 2004

Entomological Society of America, Graduate Student Counsel representative, 2000- 2004

INVITED LECTURES/SYMPOSIA

From individuals to populations: Modeling toxicity data across levels of biological organization. Society of Environmental Toxicology and Chemistry. Portland, Oregon. Nov 2004.

EPA Wildlife Research Workshop. Invited participant. Society of Environmental Toxicology and Chemistry. Portland,

Oregon. Nov 2004.

Applied Population Ecology. University of West Florida. Pensacola, Florida. Jan 2004.

Projecting population-level responses of mysids exposed to endocrine disrupting chemicals. Society of Integrative and Comparative Biology. New Orleans, Louisiana. Jan 2004.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Participant in the Wildlife Research Strategy Planning workgroup.

Technology transfer of ORD modeling software programs to Program Offices.

PUBLICATIONS

(Publications represent 6 out of a total of 12 for the period 2003-2006)

Raimondo, S., A. Digirolamo, and M. G. Barron. In print. Risk Assessment of Mercury Exposure on a Florida Panther Metapopulation. In. R. Akcakaya (Ed.), Population-level Ecotoxicological Risk Assessment.

Raimondo, S., C. L. McKenney, Jr., and M. G. Barron. 2006. Application of elasticity analyses and perturbation simulations in determining stressor impacts on population growth rate and extinction risk. Human and Ecological Risk Assessment. In print.

Raimondo, S. and C. L. McKenney, Jr. 2006. From individuals to populations: Modeling toxicity data across two levels of biological organization. Environmental Toxicology and Chemistry. In print.

Raimondo, S. and C. L. McKenney, Jr. 2005. Projecting population-level response of mysids exposed to endocrine disrupting chemicals. Integrative and Comparative Biology. 45: 151-157.

Raimondo, S. and C. L. McKenney, Jr. 2005. Projected effects of thiobencarb exposure on the populations of the mysid, *Americamysis bahia*, and extinction probability in a dose-decay exposure system. Environmental Toxicology and Chemistry. 24: 564-572.

Raimondo, S., M. Turcáni, J. Patoèka, and A. M. Liebhold. 2004. Interspecific synchrony among foliage-feeding forest Lepidoptera species and the role of generalist predators as possible synchronizing agents. Oikos. 107: 462-470.

Raimondo, S., A. M. Liebhold, J. S. Strazanac, and L. Butler. 2004. Population synchrony within and among Lepidoptera species in relation to weather, phylogeny, and larval phenology. Ecological Entomology. 29: 96-105.

BIOGRAPHICAL SKETCH

NAME: Jay R. Reichman

POSITION TITLE: Ecologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Texas A&M University	B.S.	1982	Ecology, Evolution and Behavior
University of Texas at Austin	Ph.D.	2002	

PROFESSIONAL EXPERIENCE

Post-doctoral Fellow, US EPA, Western Ecology Division, 2002–2005
Lecturer, Department of Kinesiology, University of Texas at Austin, 1998–2002
Graduate Assistant Instructor, Department of Zoology, University of Texas at Austin, 1996–1998
Graduate Teaching Assistant, Department of Zoology, University of Texas at Austin, 1993–1996
Chief Instructor, Tom's Dive and Ski, Inc. Austin, TX. 1983–1993
Operations Manager, Texas Impressions, Inc. Austin, TX. 1988–1990
Branch Manager / Purchasing Agent, Roy E. Davis & Co. Dallas, TX. 1982–1988

PROFESSIONAL SOCIETIES& PUBLICATION BOARDS:

The Society for Molecular Biology and Evolution

SELECTED AWARDS AND HONORS

US EPA Scientific and Technological Achievement Award: Level I, 2005
US EPA National Honor Award: Gold Medal, Gene Flow Project Research Team, 2005
US EPA NHEERL Goal 5 Award: Future Issues, 2005
US EPA WED, Division Team Honor Award, 2004
University of Texas Carl Hartman Graduate Fellowship, 2001
University of Texas Division of Physical Education Faculty Merit Review Committee, 1999-2001
University of Texas Dorothea Bennett Memorial Fellowship, 2000
University of Texas Zoology Scholarship Endowment for Excellence, 2000, 1999, 1998, 1997, 1995
University of Texas Division of Physical Education Budget Committee, 1999-2000

INVITED LECTURES/SYMPOSIA

Establishment of transgenic herbicide-resistant creeping bentgrass (*Agrostis stolonifera* L.) in non-agronomic habitats.
U.S. Environmental Protection Agency Office of Prevention, Pesticides & Toxic Substances. Washington, D.C. 2006.

Assessing Risks of Transgene Flow from GM Crops to Native Plants. The National Science and Technology Council Symposium for Agricultural Biotechnology Risk Analysis. Washington D.C. 2005.

Assessing Transgene Flow and Introgression on Plant Communities. U.S. Environmental Protection Agency Workshop on Population Genetics in Agroecosystems. Washington, D.C. 2005

Development of molecular monitoring technologies to measure transgene flow and introgression in crop and non-crop plant species. Research Center for Toxicology & Hygienic Regulation of Biopreparations. Sepukhov, Moscow Region, Russia. 2005.

Molecular methods of monitoring exposure and effects of transgene flow into resident plant populations. U.S. Environmental Protection Agency sponsored symposium on strategic monitoring for ecological impacts

from

- crops with plant incorporated protectants. Washington, D.C. 2004
- Molecular methods: Benefits and limitations in risk assessment. Biotechnology mini-symposium, U.S. Environmental Protection Agency plant incorporated protectants experimental use permits workshop. Washington, D.C. 2004
- PCP gene families in Symbiodinium: slow concerted evolution, isoform diversity and spectral tuning of chromophores. Oregon State University, Department of Botany and Plant Pathology. Corvallis, OR. 2003.
- Characterization and evolution of PCP genes in symbiotic dinoflagellates. Oregon State University, Zoology Department. Corvallis, OR. 2003.
- Threats to coral reefs: bleaching and other things that kill coral. SeaSpace. Houston, TX. 1997.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

- Graduate STAR Fellowship Relevancy Review Panel, 2006
- NSF Biological Oceanography Program Proposal Reviewer, 2005
- Environmental Biosafety Research Manuscript Reviewer, 2005
- European Journal of Protistology Manuscript Reviewer, 2005
- FEMS Microbiology Letters Manuscript Reviewer, 2004

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

- US EPA Toxicogenomics Core Advisory Group, 2006
- US EPA Working Group on data requirements for plant incorporated protectants, 2006
- US EPA Technical Advisor to the Russian Research Centre for Toxicology and Hygienic Regulation of Biopreparations, 2005

PUBLICATIONS

- Reichman, J.R., Watrud, L.S., Lee, E.H., Burdick, C.A., Bollman, M.A., Storm, M.J., King, G.A. and Mallory-Smith, C. 2006. Establishment of transgenic herbicide-resistant creeping bentgrass (*Agrostis stolonifera* L.) in non-agronomic habitats. *Molecular Ecology*, doi: 10.1111/j.1365-294X.2006.03072.x.
- Watrud, LS, Lee, EH, Fairbrother, A, Burdick C, Reichman, JR, Bollman, M, Storm M, King, G and van De Water, P, (2004). Evidence for landscape level pollen-mediated gene flow from genetically modified creeping bentgrass using CP4 EPSPS as a marker. *Proceeding of the National Academy of Science* 101 (40); 14355-14538.
- Automated DNA Sequencing Analysis. USEPA Western Ecology Division, Gene Flow Project SOP 3.0, Version 1.0. 2003.

BIOGRAPHICAL SKETCH

**NAME: John M. Rogers POSITION TITLE: Chief, Developmental Biology Branch,
NHEERL, EPA**

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Miami, Coral Gables, FL	B.S.	1976	Biology
University of Miami, Coral Gables, FL	M.S.	1979	Biology
University of Miami, Coral Gables, FL	Ph.D.	1982	Biology

PROFESSIONAL EXPERIENCE

Sept. 1976 - May 1982 Graduate Teaching Assistant, Biology Dept., University of Miami.
May 1982 - July 1982 Lecturer in Biology, Biology Dept., University of Miami
1984 Postdoctoral, Nutrition, University of California, Davis, CA
Nov. 1984 - Dec. 1988 Research Biologist, Perinatal Toxicology Branch, Developmental Biology
Division, HERL, U.S. EPA
Spring, 1987; Summer, 1990 Visiting Assistant Professor, Department of
Zoology, North Carolina State University, Raleigh, NC
Jan. 1989 - Mar. 1991 Chief, Experimental Teratology Section, Perinatal Toxicology Branch,
Developmental Toxicology Division, Health Effects Research Laboratory, U.S.
EPA
March 1991 - Present Chief, Developmental Biology Branch, Reproductive Toxicology Division,
NHEERL, U.S. EPA

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Teratology Society
Society of Toxicology
Developmental Origins of Health and Disease (DOHaD) Society
1997 - 2000 Secretary/Treasurer, SOT Repro./Devel. Tox. Specialty Section
1998 - 2004 Treasurer, Teratology Society
2002- 2005 VP-elect(02), VP(03), President (04), Past-President (05)
SOT Reproductive and Developmental Toxicology Specialty Section

SELECTED AWARDS AND HONORS

EPA Scientific and Technical Achievement Awards: 1991 Level II, Level III; 1992 Level II; 1993 Level III (2); 1994 Level I; 1996, Level III; 1998, Honorable Mention. Lucille S. Hurley Award, 2005; Robert L. Brent Award, 2006.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY (Within last 5 years)

Editorial Board, Birth Defects Research Part B, Reproductive and Developmental Toxicology, 2003-present
Member, Center for the Evaluation of Risks to Human Reproduction, Panel on Hydroxyurea, 2006.
Co-Chair, SOT Symposium: "Developmental Toxicology of the Lung." New Orleans, LA, SOT, March 6, 2005.
Co-Chair, SOT Workshop: "Zebrafish – A Model Organism for Assessing Developmental Toxicity in Drug Discovery/Environmental Risk Assessment." Baltimore, MD, SOT, March 24, 2004.
Member, FASEB NIH Federal Funding Committee (representing the Teratology Society), 2005-present.
Member, EPA Pregnancy and Environmental Health Campaign, 2005-present.

Teratology Society Strategic Planning Committee, 2002.

Member, ILSI Health and Environmental Sciences Institute's Working Group on Interpretation of Skeletal Variations for Human Health Risk Assessment. 1999-2001.

Member, Center for the Evaluation of Risks to Human Reproduction, Panel on Methanol, 2000-2002.

INVITED LECTURES/SYMPOSIA (Within last 3 years)

The Barker Hypothesis: Implications for Human Health and Well-Being. Mars/MDRU Conference on Epigenetics: Fetal Origins of Health, McLean, VA, June 9, 2004.

Evaluation and Interpretation of Maternal Toxicity in Segment II Studies: Issues, Some Answers and Data Needs. International Union of Toxicologists Meeting, Tampere, Finland, July 14, 2004.

Fetal Skeletal Examinations. Continuing Education Course on Basics of Developmental Toxicology, Society of Toxicology Annual Meeting, New Orleans, LA, March, 2005.

Case Example: Zinc. ILSI Health and Environmental Sciences Institute (HESI) sponsored Continuing Education Course: "Dose-Dependent Transitions in Mechanisms of Toxicity: What Are They? How Are They Applied in Risk Assessment?," Annual Meeting of the American College of Toxicology (ACT), Williamsburg, VA, November 6, 2005.

Everything I Needed to Know I Learned in the Womb: Developmental Origins of Health and Disease.

Neurotoxicology Division, NHEERL, ORD, USEPA, Research Triangle Park, NC, November 30, 2005.

Maternal Dietary Folate Intake and Response to Diverse Developmental Toxicants in Rodents. Sixteenth Lucille S. Hurley Distinguished Seminar Speaker, Department of Nutrition and Western Human Nutrition Research Center, University of California, Davis, CA October 17, 2005

Of Men, Mice, Monkeys and Metabolism: An Update on the Developmental Toxicity of Methanol. Robert L. Brent Lecture, Teratology Society Annual Meeting, Tucson, AZ, June 26, 2006.

Case Example: Zinc. Round Table on "Dose-Dependent Transitions in Mechanisms of Toxicity" EUROTOX 2006 Meeting, Cavtat, Croatia, September 22, 2006.

Long Term Effects of the Developmental Environment: Implications for Developmental Toxicity Risk Assessment. University of Louisville, Louisville, KY, November 21, 2006 (pending)

PUBLICATIONS (Within last 5 years)

Massaro, E.J., and J.M. Rogers (eds). (2002) Folate in Human Development, Humana Press, Boca Raton, FL

Hanna LA, MS Clegg, T Momma, JM Rogers, GP Daston, and CL Keen (2003) Zinc influences the *in vitro* development of peri-implantation mouse embryos. In press, Birth Defects Research, Part A Clin Mol Teratol 67:414-420.

Leazer TM, GP Daston, CL Keen, and JM Rogers (2003) The embryoletality of lipopolysaccharide in CD-1 and metallothionein I-II null mice: Lack of a role for induced zinc deficiency or metallothionein induction. Toxicol Sci 73:442-447.

Tarka-Leeds DK, JD Suarez, NL Roberts, JM Rogers, MP Hardy, and GR Klinefelter (2003) Gestational exposure to ethane dimethanesulfonate permanently alters reproductive competence in the CD-1 mouse. Biol Reprod 69:959-967.

Thibodeaux JR, RG Hanson, JM Rogers, BE Grey, BD Barbee, JH Richards, JL Butenhoff, LA Stevenson, and C Lau (2003) Exposure to perfluorooctane sulfonate during pregnancy in rat and mouse. I: maternal and prenatal evaluations. Toxicol Sci 74:369-381.

Lau C, JR Thibodeaux, RG Hanson, JM Rogers, BE Grey, ME Stanton, JL Butenhoff, and LA Stevenson (2003) Exposure to perfluorooctane sulfonate during pregnancy in rat and mouse. II: postnatal evaluation. Toxicol Sci 74:382-292.

Rogers JM, and BD Abbott (2003) Screening for developmental toxicity of tobacco smoke constituents. Toxicol Sci 75:227-228.

Rogers EH, ES Hunter, MB Rosen, JM Rogers, C Lau, PC Hartig, BM Francis, and N Chernoff (2003) Lack of evidence for intergenerational reproductive effects due to prenatal and postnatal undernutrition in the female CD-1 mouse. Reprod Toxicol 17:519-525.

Tarka-Leeds DK, DW Herr, GR Klinefelter, and J.M. Rogers (2003) Effects of gestational exposure to ethane

- dimethanesulfonate in CD-1 mice: microtia and preliminary hearing tests. *Birth Defects Res Part B, Dev Reprod Toxicol* 68:383-390.
- Rogers JM, RW Setzer, S Branch, and N Chernoff (2003) Chemically-induced supernumerary ribs in CD-1 mice: Size distribution and dose-response. *Birth Defects Res Part B, Dev Reprod Toxicol* 71:17-25.
- Grasty RC, BE Grey, CS Lau, and JM Rogers (2003) Prenatal window of susceptibility to perfluorooctane sulfonate-induced neonatal mortality in the Sprague-Dawley rat. *Birth Defects Res Part B, Dev Reprod Toxicol* 68:465-471.
- Keen CL, MS Clegg, LA Hanna, L Lanoue, JM Rogers, GP Daston, P Oteiza, and JY Uriu-Adams (2003) The plausibility of micronutrient deficiencies being a significant contributing factor to the occurrence of pregnancy complications. *J Nutr* 133(5 Suppl 2):959-967.
- Corley RA, TJ Mast, EW Carney, JM Rogers, and GP Daston (2003) Evaluation of physiologically based models of pregnancy and lactation for their application in children's health risk assessments. *Crit Rev Toxicol* 33:137-211.
- Rogers JM, RW Setzer, and N Chernoff (2003) Toxicant-induced cervical and lumbar ribs in rodents. In: *The Skeleton. Biochemical, Genetic, and Molecular Interactions in Development and Homeostasis*. EJ Massaro and JM Rogers, eds. Humana Press, Totowa, NJ, pp. 373-384.
- Rogers JM, KC Brannen, BD Barbee, RM Zucker, and SJ Degitz (2004) Maternal methanol exposure during gastrulation causes holoprosencephaly, facial dysgenesis and cervical vertebral malformations in C57BL/6J mice. *Birth Defects Research, Part B, Dev Reprod Toxicol* 71:17-25.
- Degitz SJ, RM Zucker, CY Kawanishi, GS Massenburg, and JM Rogers (2004) Pathogenesis of methanol-induced craniofacial defects in C57BL/6J mice. *Birth Defects Research, Part A, Clin Mol Teratol* 70:172-178.
- Degitz SJ, JM Rogers, RM Zucker, and ES Hunter III (2004) Developmental toxicity of methanol: pathogenesis in CD-1 and C57BL/6J mice exposed in whole embryo culture. In press, *Birth Defects Research, Part A, Clin Mol Teratol* 70:179-184.
- Slikker W Jr., ME Andersen, MS Bogdanffy, JS Bus, SD Cohen, RB Conolly, RM David, NG Doerr, DC Dorman, DW Gaylor, D Hattis, JM Rogers, RW Setzer, JA Swenberg, K Wallace (2004) Dose-dependent transitions in mechanisms of toxicity. *Toxicol Appl Pharmacol* 201:203-225.
- Slikker W Jr., ME Andersen, MS Bogdanffy, JS Bus, SD Cohen, RB Conolly, RM David, NG Doerr, DC Dorman, DW Gaylor, D Hattis, JM Rogers, RW Setzer, JA Swenberg, K Wallace (2004) Dose-dependent transitions in mechanisms of toxicity: case studies. *Toxicol Appl Pharmacol* 201:226-294.
- Lau C, JL Butenhoff, and JM Rogers (2004) The developmental toxicity of perfluoroalkyl acids and their derivatives. *Toxicol Appl Pharmacol* 198:231-241.
- Chernoff N, and JM Rogers (2004) Supernumerary ribs in developmental toxicity bioassays and in human populations: incidence and biological significance. *J Toxicol Environ Health Part B: Crit Rev* 7:437-450.
- Lau C, and JM Rogers (2004) Embryonic and fetal programming of physiological disorders in adulthood. *Birth Defects Research Part C: Embryo Today*, 72:300-312.
- Grasty, RC, JA Bjork, KB Wallace, CS Lau, and JM Rogers (2005) Effects of prenatal perfluorooctane sulfonate (PFOS) exposure on lung maturation in the perinatal rat. *Birth Defects Res Part B, Dev Reprod Toxicol* 74:405-416.
- Massaro, E.J., and J.M. Rogers (eds). (2005) *The Skeleton: Biochemical and Molecular Interactions in Development and Homeostasis*, Humana Press, Boca Raton, FL.
- Rogers JM, N Chernoff, CL Keen, and GP Daston (2005) Evaluation and interpretation of maternal toxicity in Segment II studies: Issues, some answers and data needs. *Toxicol Appl Pharmacol* 207:S367-S374.
- Lau C, Thibodeaux JR, Hanson RG, Narotsky MG, Rogers JM, Lindstrom AB, Strynar MJ. (2006) Effects of perfluorooctanoic acid exposure during pregnancy in the mouse. *Toxicol Sci.* 90:510-518.
- Rogers JM (2006) Toxicological Highlight. Casting a broad network: Fishing for mechanisms of retinoid teratogenicity. *Toxicol. Sciences*, in press.
- Rogers JM (2006) The Barker Hypothesis: Implications for Developmental Toxicology. *Current Opinions in Endocrinology and Diabetes*, in press.
- Rogers JM, and R.J. Kavlock (2007) Developmental toxicology. In: *Casarett and Doull's Toxicology*, Seventh Ed., C.D. Klaassen, ed. McGraw-Hill, New York, in press.

BIOGRAPHICAL SKETCH

NAME: Mitchell B. Rosen

POSITION TITLE: Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Delaware	B.S.	1977	Animal Science
North Carolina State University	M.S.	1980	Animal Science
North Carolina State University	Ph.D.	2000	Physiology

PROFESSIONAL EXPERIENCE

1982-1984: Research Technician III, Animal Science Department, North Carolina State University, Raleigh, NC
1984-1995: Scientist, ManTech Environmental Sciences, RTP, NC
1995-present: Research Biologist, Gamete and Early Embryo Biology Branch, Reproductive Toxicology Division, NHEERL, U.S. EPA

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Toxicology
Society of Developmental Biology

INVITED LECTURES/SYMPOSIA

10/2001: Toxicology Department, North Carolina State University, invited seminar
1/2003: Cell and Developmental Biology 123, University of North Carolina, guest lecturer

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

1/2005 to 12/2005: Performance-based Quality Assurance Workgroup for Genomics Research
1/2005 to 7/2006: NHEERL Genomics Proteomics Committee
9/2005: MicroArray Quality Control (MAQC) Project Test Laboratory, 2005
8/2006 to present: NHEERL Toxicogenomics Core Advisory Group

PUBLICATIONS

Rosen, MB, VS Wilson, JE Schmid, and LE Gray Jr.: Gene expression analysis in the ventral prostate rats exposed to either vinclozolin or procymidone. *Reprod Toxicol* 19:367-379, 2005.

Rogers, EH, ES Hunter, MB Rosen, JM Rogers, C Lau, PC Hartig, BM Francis, and N Chernoff.: Lack of evidence for intergenerational reproductive effects due to prenatal and postnatal undernutrition in the female CD-1 mouse. *Reprod Toxicol* 17:519, 2003.

Chernoff, N, ES Hunter III, LL Hall, MB Rosen, CF Brownie, D Malarkey, M Marr and J Herkovits. Lack of teratogenicity of microcystin-LR in the mouse and toad. *J Applied Toxicol.* 22:13-17, 2002.

Rosen, MB, and N Chernoff.: 5-aza-2'-deoxycytidine-induced cytotoxicity and limb reduction defects in the mouse. *Teratology* 65:180-190, 2002.

Branch S, BM Francis, MB Rosen, CF Brownie, GA Held, and N Chernoff.: Differentially expressed genes associated with 5-aza-2'-deoxycytidine-induced hindlimb defects in the Swiss Webster mouse. *J Biochem Mol. Toxicol.* 12:135-141, 1998.

Hartig, PC, MC Cardon, MB Rosen, N Chernoff, and CY Kawanishi.: In situ hybridization and oligmer probes: Evaluation of gene expression during development. *Toxicol Methods* 6:13-22, 1996.

Rogers, JM, BM Francis, KK Sulik, AJ Alles, EJ Massaro, RM Zucker, KH Elstein, MB Rosen and N Chernoff.: Cell death and cell cycle perturbations in the developmental toxicity of the demethylating agent 5-aza-2'-deoxycytidine. *Teratology* 50:332-339, 1995.

Rosen, MB, BM Francis, and N Chernoff.: Subtractive hybridization: A technique for the isolation of differentially expressed genes. *Toxicol. Methods* 4:135-147, 1994.

Rosen, MB, HS House, BM Francis, and N Chernoff.: Teratogenicity of 5-azacytidine in the Sprague-Dawley rat. *J. Toxicol. Environ. Health* 29:201-210, 1990.

Chernoff, N, RW Setzer, DB Miller, MB Rosen, and JM Rogers.: Effects of chemically-induced maternal toxicity on prenatal development in the rat. *Teratology* 42:651-658, 1990.

Francis, BM, YS Huang, PC Hartig, MB Rosen, CY Kawanishi, and N Chernoff. Effects of murine cytomegalovirus on development: Lack of interactions of virus and sodium salicylate. *J. Applied Pharmacol.* 10:43-46, 1990.

Francis, BM, JM Rogers, KK Sulik, AJ Alles, KH Elstein, RM Zucker, EJ Massaro, MB Rosen, and N Chernoff.: Cyclophosphamide teratogenesis: Evidence for compensatory responses to induced cellular toxicity. *Teratology* 42:473- 482, 1990.

Book Chapters

Gray Jr. LE, V Wilson, T Stoker, C Lambright, J Furr, N Noreiga, P Hartig, M Cardon, M Rosen, G Ankley, A Hotchkiss, E Orlando, LJ Guillette, and W Kelce.: Environmental Androgens and Antiandrogens: An expanding chemical universe. In: Naz, R. editor. *Endocrine disruptors: Effects on male and female reproductive systems.* Boca Raton: CRC Press LLC. Pages 313-343, 2005.

Abbot BD, MB Rosen, and G Held. Cellular, biochemical, and molecular techniques in developmental toxicology. In: Hood R editor. *Developmental and Reproductive Toxicology, a Practical Approach.* Boca Raton: CRC Press LLC. Pages 600-620, 2005

BIOGRAPHICAL SKETCH

NAME: Christine L. Russom

POSITION TITLE: Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Minnesota – Duluth	B.S. M.S. Ph.D.	1979	Biology

PROFESSIONAL EXPERIENCE

1992 - Present Biologist, USEPA, ORD/NHEERL
1990 - 1992 Research Aquatic Biologist; USEPA, ORD/NHEERL
1987-1990 Biologist, USEPA, ORD/NHEERL

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Bulletin of Environmental Contamination and Toxicology Editorial Board, 1992-2000

Society of Environmental Toxicology and Chemistry

SELECTED AWARDS AND HONORS

U.S. EPA Gold Medal for Exceptional Service-2004: Endangered Species Act Collaborative Action Team

U.S. EPA NHEERL's Goal 1 Award-2003: Support the Agency's Mission

U.S. EPA Science Achievement Award for Biology/Ecology-2001: Ecological Soil Screening Level Effort

U.S. EPA/ORD Scientific and Technological Achievement Award-1998: Level III for journal article

INVITED LECTURES/SYMPOSIA

The U.S. EPA's ECOTOX Database: Bioconcentration Data Subset. ILSI HESI Bioaccumulations Workshop, Baltimore, MD, November 11, 2005.

ECOTOX Database and ASTER System. ECB Consultation Meeting on the Development of a QSAR Decision Support System (DSS). Milan, Italy, April 28-29, 2005.

Russom, C.L. 2005. ECOTOX and ASTER Systems: Chemical Information Aspects. Fourth Meeting on U.S. Government Chemicals Databases, Frederick, MD, July 12-13, 2005.

The ECOTOX Database. Society for Risk Analysis Annual Meeting, New Orleans, LA, December 8-11, 2002.

ECOTOX: An ecological effects database. Computing in Environmental Management, Research Triangle Park, NC, December 12. 1996.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Participant in the European Union, European Chemical Bureau's Consultation Meeting on the Development of a QSAR Decision Support System (2005)

Expert Panel Member - Workshop on Environmental Categorization for Persistence, Bioaccumulation and Inherent Toxicity of Substances on the Domestic Substances List Using QSARS (1999)

Contributor to OECD QSAR Applications Toolbox (2006)

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

NCCT Chemical Workgroup, Co-Chair

Participate in discussions/writing of ORD's Multi-year Plan for Safe Pesticides/Safe Products, 2007-2014. (2004-present)

Participant in discussions/writing with EPA's Office of Water and USFWS on the development of methods for conducting biological evaluations of the Clean Water Act (CWA) 304(a) aquatic life criteria guidance, in accordance with the procedures in 51 CFR part 402 of the Endangered Species Act. (2002-2005)

Participant in Council on Environmental Quality facilitated review of OPP/EFED Risk Assessment Procedures as they relate to threatened and endangered species resulting in Endangered Species Act Counterpart Regulation. (2004)

Participant in NCEA facilitated workshop on the development of the Causal Analysis/Diagnosis Decision Information System (CADDIS), and subsequent reviews of the CADDIS system. (2002 - 2006)

PUBLICATIONS

Weisbrod, A.V., L.P. Burkhard, J. Arnot, O. Mekenyan, P.H. Howard, C.L. Russom, R. Boethling, Y. Sakuratani, T. Traas, T. Bridges, C. Lutz, M. Bonnell, K. Woodburn, T. Parkerton. Workgroup Report: Review of Fish Bioaccumulation Databases used to identify Persistent, Bioaccumulative, Toxic Substances. *Environ. Health Perspect. In press.*

Russom, C.L., R.L. Breton, J.D. Walker, and S.P. Bradbury. 2003. An overview of the use of quantitative structure-activity relationships for ranking and prioritizing large chemical inventories for environmental risk assessments. *Environ. Toxicol. Chem.* 22:1810-1821.

Bradbury, S.P., C.L. Russom, G.T. Ankley, T.W. Schultz, and J.D. Walker. 2003. Overview of data and conceptual approaches for derivation of quantitative structure-activity relationships for ecotoxicological effects of organic chemicals. *Environmental Toxicology and Chemistry* 22:1789-1798.

Russom, C.L. 2002. Mining environmental toxicology information: Web resources. *Toxicology* 173:75-88.

Kahl, M.D., C.L. Russom, D.L. DeFoe, and D.F. Hammermeister. 1997. Saturator units for generating chemical stock solutions at near water solubility for use in bioassays. *Chemosphere* 39:539-551.

Russom, C.L., S.P. Bradbury, S.J. Broderius, D.E. Hammermeister, and R.A. Drummond. 1996. Predicting modes of toxic action from chemical structure: Acute toxicity in fathead minnow (*Pimephales promelas*). *Environ. Toxicol. Chem.* 16:948-967.

Karabunarliev, S., O.G. Mekenyan, W. Karcher, C.L. Russom, and S.P. Bradbury. 1996. Quantum-chemical descriptors for estimating the acute toxicity of electrophiles to the fathead minnow (*Pimephales promelas*): An analysis based on molecular mechanisms. *Quant. Struct.-Activ. Relat.* 15:302-310.

Karabunarliev, S., O.G. Mekenyan, W. Karcher, C.L. Russom, and S.P. Bradbury. 1996. Quantum-chemical descriptors for estimating the acute toxicity of substituted benzenes to the guppy (*Poecilia reticulata*) and fathead minnow (*Pimephales promelas*). *Quant. Struct.-Activ. Relat.* 15:311-320.

NARRATIVE

Ten years of experience in conducting and interpreting results from tests of chemicals on aquatic species. Twelve years of experience in the development and maintenance of ecotoxicology databases and expert systems used in conducting risk assessments, with special focus on development of QSAR-based models. Provide technical direction for the development and maintenance of ecotoxicology databases and expert systems used in conducting risk assessments. Database tasks include providing direction and oversight in system design, literature acquisition, data abstraction, review and entry, user support and outreach, maintenance of documentation, and all aspects of quality assurance. Expert system tasks include analyzing data using statistical packages, developing quantitative structure activity relationship (QSAR) models when appropriate, and oversight of all aspects of quality assurance and system design. Provide technical assistance to offices within EPA regarding the use of these databases.

BIOGRAPHICAL SKETCH

NAME: Gary S. Saylor **POSITION TITLE:** *Director.* UT-ORNL Joint Institute for Biological Sciences

EDUCATION/TRAINING

Postdoctoral, 1975 Department of Microbiology, University of Maryland.
Ph.D., 1974 Department of Bacteriology and Biochemistry, University of Idaho.
B.S., 1971 Department of Bacteriology, North Dakota State University.
A.A., 1969 Liberal Arts, Bismarck Junior College.

PROFESSIONAL EXPERIENCE

2006-Present *Director.* UT-ORNL Joint Institute for Biological Sciences
2006 *Beaman Distinguished Professor,* The University of Tennessee
2005-Present *Interim Director.* Institute for a Secure and Sustainable Environment, University of Tennessee.
2000-2005 *Distinguished Professor.* The University of Tennessee
1991-2005 *Director.* Waste Management Research and Education Institute, University of Tennessee, Center of Excellence.
1986-Present *Founding Director.* Center for Environmental Biotechnology, University of Tennessee, Designated Research Center-of-Excellence, 2000
1985-Present *Professor.* Departments of Microbiology and Ecology and Evolutionary Biology. Adjunct, Department of Environmental Engineering. Faculty Appointments: Environmental Toxicology Program and Biotechnology Program.
1987-1991 *Director for Research.* Waste Management Research and Education Institute, University of Tennessee, Center of Excellence.
1980-1985 *Associate Professor.* University of Tennessee, Department of Microbiology and the Graduate Program in Ecology.
1976-1980 *Assistant Professor.* University of Tennessee, Department of Microbiology and the Graduate Program in Ecology.
1974-1975 *Postdoctoral Research Fellow.* Department of Microbiology, University of Maryland.
1971-1974 *Graduate Teaching and Research Assistant.* University of Idaho .
1971 *Research Associate.* North Dakota Water Resources Committee.
1970 *Research Technician.* Department of Chemistry, North Dakota State University.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Society for Microbiology American Association for the Advancement of Science
American Chemical Society Society for Environmental Toxicology and Chemistry
Society for Industrial Microbiology The International Society for Optical Engineering

Editorial Boards. Molecular Ecology, 1991-1999; Biodegradation, 1990-present; Microbial Ecology, 1989-1993; Industrial Microbiology, 1986-1988; Applied and Environmental Microbiology, 1986-1989; Journal of Microbiological Methods, 1982-2000. American Chemical Society, Associate Editor, Environmental Science and Technology, 1999-present.

SELECTED AWARDS AND HONORS (selected)

Chairman, Applied and Environmental Division, American Society for Microbiology 1990.
Fellow, American Academy of Microbiology, 1991 (Lifetime)

Senior Researcher Award, University of Tennessee College of Arts and Sciences, 1994
Procter and Gamble Award in Applied and Environmental Microbiology, American Society for Microbiology, 1994.
Silver and Gold Distinguished Alumni Award, University of Idaho, 1995.
Discover Magazine Technology Innovation Award finalist with M. Simpson, 1998.
SPHERE Award, DOW Foundation, 1998-2000.

INVITED LECTURES/SYMPOSIA (selected)

2001

King Saud University, Saudi Arabia. “Environmental Biotechnology: Principles and Practices” and “Application of Biotechnology in Monitoring and Bioremediation of Contaminated Environments.” Riyadh, Saudi Arabia. Invited seminars. (February)

Workshop on the Use of Genetically Modified Organisms for the Bioremediation of Pollutants. “Field release of *P. fluorescens* HK44: Long term persistence and field performance of a bioremediation bioluminescent bioreporter.”, England. Invited seminar. (March)

American Society for Microbiology Annual Meeting. “Population Monitoring in Bioaugmentation and Waste Treatment.” Orlando, FL. Invited presentation. (May)

International Symposium on New Aspects of Environmental Biotechnology to Clean Up Contaminated Soil and Groundwater and Roundtable on Future Direction of Environmental Microbiology and Biotechnology. “Environmental Biotechnology at the MicroElectronic Interface.” Tokyo, Japan. Invited keynote speaker. (September)

2002

DARPA Biofilms/Seedling Meeting. Jackson Hole, Wyoming. Invited presentation. (May)

Brookhaven National Laboratory Review Program, Environmental Sciences Department. Upton, NY. Invited reviewer. (July)

2003

Society for Applied Microbiology Symposium “Lab on a Chip.” Birmingham, England. Invited presentation. (January)

EU-US Short Course in Environmental Biotechnology. Madrid, SPAIN, Invited presentation. “Implementation of Bioluminescent Bioreporter Technology for On-line Real-time Environmental Sensing and Strategies for Gene Expression Analysis in Biodegradation Process Monitoring and Control” (February).

2004

Photonics West 2004 Program. San Jose, CA. Invited lecture. (January).

NSF Advancing the Quality of Water (AQWA) Workshop. Chapel Hill, NC. Invited lecture. (March).

7th Biennial Symposium: International Society for Environmental Biotechnology. Chicago, IL. Invited speaker. “Environmental Chemical Biosensing using Bioluminescent Bioreporting Bacteria and Yeast”(June).

Industrial Microbiology and Biotechnology Meeting. Anaheim, CA. Invited speaker. “Whole cells as components in micro- and nanoscale devices and systems” (July)

32nd Annual Meeting of the American Society for Photobiology. Invited participation. Seattle, WA. “A Yeast Reporter Strain Expressing Bacterial Bioluminescence for Rapid, Sensitive Detection of Estrogenic Compounds.” (July).

2005

Shanghai Jiao Tong University, MicroEnGen-11: 2nd SCOPE meeting on Microbial Environmental Genomics Conference, Shanghai, China, Keynote Address. (June)

IUMS 2005 Microbes in a Changing World, San Francisco, CA Invited Lecturer and Co-Chair. (July)

Gordon Conference on Engineering Sciences for Space Exploration, Les Diablerets, Switzerland, Invited Session Chair, (August).

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY (selected)

2002

Brookhaven National Laboratory Review Program, Environmental Sciences Department. Upton, NY. Invited reviewer. (July)

2004

U.S. Department of Energy (DOE) Biological and Environmental Research advisory Committee (BERAC) Committee of Visitors (COV). Germantown, Maryland. Committee member. (October).

U.S. Department of Energy Genomics: Genomes-to-Life Roadmapping Workshop. Arlington VA. Invited participation. (June).

Department of Energy NanoSummit: Nanoscale Science and Our Energy Future. Washington D.C. Invited participation. (June).

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Environmental Protection Agency's (EPA), Board of Scientific Counselors (BOSC) Executive Committee. Research Triangle Park, NC Committee member. (May 2004).

U.S. Environmental Protection Agency Science Advisory Board's Drinking Water Committee (DWC). Raleigh-Durham, NC. Committee member. (May 2004).

Environmental Protection Agency's (EPA), Board of Scientific Counselors (BOSC) Executive Committee. Washington D.C. Committee member. (September 2004).

Environmental Protection Agency's (EPA), Board of Scientific Counselors (BOSC) Executive Committee. Washington D.C. Committee member. (April 2005).

PUBLICATIONS (285 total)

1. Gupta, R.K., S.S. Patterson, S. Ripp, M.L. Simpson, and G.S. Saylor. 2003. Expression of the *Photobacterium luminescens lux* genes (*lux A, B, C, D, and E*) in *Saccharomyces cerevisiae*. *FEMS Yeast Research*. 4:305-313.
2. Nivens, D.E., T.E. McKnight, S.A. Moser, S.J. Osbourn, M.L. Simpson, and G.S. Saylor. 2004. Bioluminescent bioreporter integrated circuits: Potentially small, rugged and inexpensive whole-cell biosensors for remote environmental monitoring. *J. Appl. Microbiol.* 96:33-46.
3. Cook, K.L., A.C. Layton, H.M. Dionisi, J.T. Fleming, G.S. Saylor. 2004. Evaluation of a plasmid-based 16s-23s rDNA intergenic spacer region array for analysis of microbial diversity in industrial wastewater. *J. Microbiol. Methods*. 57:79-93.
4. Dionisi, H.M., C.S. Chewning, K.H. Morgan, F. Menn, J.P. Easter, G.S. Saylor. 2004. Abundance of dioxygenase genes similar to *Ralstonia* sp. strain U2 *nagAc* is correlated with naphthalene concentrations in coal tar-contaminated freshwater sediments. *Applied & Environmental Microbiology*. 70(7): 3988-3995.
5. Raman, D. R., E.L. Williams, A.C. Layton, R.T. Burns, J.P. Easter, A.S. Daugherty, M.D. Mullen G.S. Saylor. 2004. Estrogen content of dairy and swine wastes. *Environmental Science Technology*. 38(13), 3567-3573.
6. Layton A. C., H. M. Dionisi, H-W. Kuo, K.G. Robinson, V. M. Garrett, A. J. Meyers, and G. S. Saylor. 2005. Emergence of competitive dominant ammonia-oxidizing bacterial populations in a full-scale industrial wastewater treatment plant. *Applied & Environmental Microbiology* 71(2), 1105-1108
7. Kim, J., K. Yamaguchi, S. Lee, P.K. Tithof, G. S. Saylor, J-H. Yoon, S. J. Baek. 2005. Evaluation of polycyclic aromatic hydrocarbons in the activation of early growth response-1 and peroxisome proliferators activated receptors. *Toxicological Sciences*, Oxford University Press, Inc. 85(1), 585-593.
8. Rice, J.F., F. M. Menn, A.G. Hay, J. Sansiverino, G.S. Saylor. 2005. Natural selection for 2,4,5-trichlorophenoxyacetic acid mineralizing bacteria in agent orange contaminated soil. *Biodegradation*. 16(6), 501-512.

9. Patterson, S.S., H.M. Dionisi, R.K. Gupta, and G.S. Sayler, 2005. Codon optimization of bacterial luciferase (*lux*) for expression in mammalian cells. *Journal of Industrial Microbiology & Biotechnology*, 32(3), 115-123.
10. Yu, Chang-Ping, R. Ahuja, G.S. Sayler, K.H. Chu. 2005. Quantitative molecular assay for fingerprinting microbial communities of wastewater and estrogen-degrading consortia. *Applied & Environmental Microbiology*, 71(3), 1433-1444.
11. Troegl, J., S. Ripp, G. Kuncova, G.S. Sayler, A. Churava, P. Parik, K. Demnerova, J. Halova, L. Kubicova. 2005. Selectivity of whole cell optical biosensor with immobilized bioreporter *Pseudomonas fluorescens* HK44. *Sensors and Actuators, B: Chemical*, 107(1), 98-103.
12. Sanseverino, J., R.K. Gupta, A.C. Layton, S.S. Patterson, S.A. Ripp, L. Saidak, M.L. Simpson, T.W. Schultz, G.S. Sayler. 2005. Use of *Saccharomyces cerevisiae* BLYES Expressing Bacterial Bioluminescence for Rapid, Sensitive Detection of Estrogenic Compounds. *Applied and Environmental Microbiology*. 71(8), 4455-4460.
13. Austin, D.W., M.S. Allen, J.M. McCollum, R.D. Dar, J.R. Wilgus, G.S. Sayler, N.F. Samatova, C.D. Cox, M.L. Simpson. 2006. Gene Network Shaping of Inherent Noise Spectra. *Nature* 439(7076), 608-611.
14. Wan, B., J.T. Fleming, T.W. Schultz, G.S. Sayler. 2006. In Vitro Immune Toxicity of Depleted Uranium: Effects on Murine Macrophages, CD4⁺ T-cells and Gene Expression Profiles. *Environmental Health Perspectives*, 114(1), 85-91.
15. Ripp, S., P. Jegier, M. Birmele, C.M. Johnson, K.A. Daumer, J.L. Garland and G.S. Sayler. 2006 Linking bacteriophage infection to quorum sensing signalling and bioluminescent bioreporter monitoring for direct detection of bacterial agents. *Journal of Applied Microbiology*, (in Press)
16. Oguz, M. T., K.G. Robinson, A.C. Layton, G.S. Sayler. 2006. Volatile fatty acid impacts on nitrite oxidation and carbon dioxide fixation in activated sludge. *Water Research*. 40(4), 665-674.
17. Hawkins, S. A.; K. G. Robinson; A.C. Layton; G.S. Sayler. 2006. A Comparison of Ribosomal Gene and Transcript Abundance during High and Low Nitrite Oxidizing Activity Using a Newly Designed Real-Time PCR Detection System Targeting the *Nitrobacter* spp. 16S-23S Intergenic Spacer Region. *Environmental Engineering Science*, 23(3), 521-532.
18. Kuo, D. H.-W.; K.G. Robinson; A.C. Layton; A.J. Meyers; G.S. Sayler. 2006. Real-Time PCR Quantification of Ammonia-Oxidizing Bacteria (AOB): Solids Retention Time (SRT) Impacts during Activated Sludge Treatment of Industrial Wastewater. *Environmental Engineering Science*, 23(3), 507-520.
19. Layton, A; L. McKay; D. Williams; V. Garrett; R. Gentry; G. Sayler. 2006. Development of *Bacteroides* 16S rRNA gene TaqMan-based real-time PCR assays for estimation of total, human, and bovine fecal pollution in water. *Applied and Environmental Microbiology*, 72(6), 4214-4224.
20. Cook, K.L.; J.I. Garland; A.C. Layton; H.M. Dionisi; L.H. Levine; and G.S. Sayler. 2006. Effect of Microbial Species Richness on Community Stability and Community Function in a Model Plant-Based Wastewater Processing System. *Microbial Ecology*.

BIOGRAPHICAL SKETCH

NAME: Gregory D. Sayles

POSITION TITLE: Acting Associate Director, National
Homeland Security Research Center

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
California Institute of Technology	B.S.	1983	Chemical Engineering
University of California, Davis	M.S.	1986	
North Carolina State University	Ph.D.	1990	

PROFESSIONAL EXPERIENCE

U.S. Environmental Protection Agency 1990 – Present
National Homeland Security Research Center, Cincinnati, OH
 2006-Present Associate Director (acting)
National Risk Management Research Laboratory, Cincinnati, OH
 2005-2006 National Program Director, Drinking Water (acting)
 2005-Present Assistant Laboratory Director - Drinking Water, Pesticides
 and Toxics, and EDCs
 2002-2005 Assistant Laboratory Director (acting)
 1990-2002 Research Chemical Engineer
University of Cincinnati, Dept. of Civil and Environmental Engineering 1995-
 2002 Associate and Assistant Adjunct Professor
Duke University, Center for Biochemical Engineering 1989 - 1990
 Postdoctoral Research Associate

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Editorial Board - *Bioremediation Journal*, 1996-2006

Societies: American Institute of Chemical Engineers, American Chemical Society, American Water Works Association, Society of Environmental Toxicology and Chemistry, Sigma Xi

AWARDS AND HONORS

U.S. EPA Bronze Medals

2005. For participation on the organizing committee of the scientific program for the endocrine disruptors research program review.

1996. For leadership in constructing the Government/Industry research partnership, the Remediation Technology Development Forum Bioremediation Consortium.

U.S. EPA Scientific and Technological Achievement Awards

2000 Level III Award for the paper, **Land Treatment of PAH-Contaminated Soil: Performance Measured by Chemical and Toxicity Assays**, *Environ. Sci. Technol.*, **33**, 4310-4317, 1999, by G.D. Sayles, C.M. Acheson, M.J. Kupferle, Y. Shan, Q. Zhou, L. Chang and J.R. Meier.

1998 Honorary Mention for the paper, **DDT, DDD, and DDE Dechlorination by Zero-Valent Iron**, *Environ. Sci. Technol.*, **31**, 3448-3454 (1997), by G.D. Sayles, G. You, M. Wang, M.J. Kupferle.

Vice President's National Performance Review Hammer Award

For contributions to the Western Governors Association Interstate Technology and Regulatory Cooperation (ITRC) Workgroup, 1997.

American Chemical Society's Certificate of Merit for Outstanding Material Content and Manner of Presentation

For the presentation, **Simple, Effective and Low-Cost Extraction Methods for Environmental Soil Analysis**, ACS 212th National Meeting, Orlando, FL, Aug. 1996.

RECENT INVITED LECTURES/SYMPOSIA

“Our Current Understanding of EDCs and Pharmaceuticals in Wastewater Treatment and CAFO management.” SETAC Annual Meeting, Montreal, Canada, November, 2006.

U.S. EPA Proposal for Encouraging the Use of Pesticide Spray Drift Reduction Technologies, *International Conference on Pesticide Application for Drift Management*, Hawaii, October 2004.

Endocrine Disrupting Chemicals: Context for Chemical Engineers, *AIChE Annual Meeting*, San Francisco, Nov. 20, 2003.

Why do Wastewater Treatment Plants Emit EDCs? *NIEHS Superfund Quad-University / EPA Region 9 Conference*, Berkeley, October 9, 2003

NRML's Risk Management Program for EDCs, *EPA Office of Research and Development / Regions Workshop on Endocrine Disruptors*, Atlanta, May 1-3, 2001.

Risk Management of Endocrine Disrupting Chemicals, *National Groundwater Association Emerging Issues Conference on Pharmaceuticals, Endocrine Disrupting Chemicals, Pesticides and Arsenic and Radon*, Minneapolis, June 7-8, 2000.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

USDA-ARS Expert Panel to review ARS Laboratory in Fargo, ND, Oct. 2004.

EPA Western Region Hazardous Substance Research Center, Science Advisory Committee, Oregon State University, 2002 - Present.

EPA Great Lakes and Mid-Atlantic Hazardous Substance Research Center, University of Michigan, 1994 - 2000.

U.S. Air Force Expert Panel Workshop on In-Situ Cometabolism of Chlorinated Solvents, Baltimore, Sept. 1997.

U. S. Air Force Expert Panel Meeting for Groundwater Circulation Wells Protocol, Salt Lake City, Oct. 1996.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Safe Pesticides/Safe Products Research Planning Team – 2002-present

Endocrine Disruptors Priority Setting Working Group - 2002 – present

Drinking Water Research Planning Team – Chair - 2005 - present

ORD Science Council – 2005- present

RECENT PUBLICATIONS (of over 40)

Lead Author for Multi-Year Plan for Drinking Water 2006

Co-Author for Multi-Year Plan for Safe Pesticides/Safe Products 2006

Co-Author for Multi-Year Plan for Endocrine Disruptors 2003

Contributor to Research Plan for Endocrine Disruptors 1998

Qi, S., C. Alonso, M.T. Suidan and G.D. Sayles (2006) “PCB Volatilization from Sediments,” *J. Environ. Engin.*, **132(1)**, 102-111.

Pfiffner, S.M, Palumbo, A.V., Sayles, G.D., Gannon, D., (2004) Microbial Population and Degradation Activity Changes Monitored During a Chlorinated Solvent Biovent Demonstration, *Ground Water Monitoring and Remediation*; **24(3)**, 102-110.

Esperanza, M., M.T. Suidan, F. Nishimura, Z-M Wang, G.A. Sorial, A. Zaffiro, P. McCauley, R. Brenner and G. Sayles (2004) Determination of Sex Hormones and Nonylphenol Ethoxylates in the Aqueous Matrixes of Two Pilot-Scale Municipal Wastewater Treatment Plants *Environ. Sci. Technol.*, **38(11)**, 3028-3035.

Acheson, C.M., Q. Zhou, Y. Shan, G.D. Sayles, and M. Kupferle (2004) Comparing the Solid Phase and Saline Extract Microtox Assays for Two Polycyclic Aromatic Hydrocarbon-Contaminated Soils. *Environ. Toxicol. Chem.*, **23(2)**, 245-251.

Sayles, G.D. (2002) Environmental Engineering and Endocrine Disrupting Chemicals, *Journal of Environmental Engineering*, **128**, 1-2

Mihopoulos, P.G , M.T. Suidan, G.D. Sayles, S. Kaskassian (2002) Numerical modeling of oxygen exclusion experiments of anaerobic bioventing, *J. Contam. Hydrology*, **58(3-4)**, 209-220.

BIOGRAPHICAL SKETCH

NAME: Patricia Schmieder

POSITION TITLE: Res. Toxicologist; Branch Chief

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Wisconsin-Stevens Point	B.S.	1978	Water Science
Rutgers University, New Brunswick, NJ	M.S.	1981	Environmental Science
Oregon State University, Corvallis, OR	Ph.D.	1990	Toxicology

PROFESSIONAL EXPERIENCE

- 2000-Present Chief: Molecular and Cellular Mechanisms Research Branch; Res. Toxicologist, USEPA, ORD, NHEERL, Mid-Continent Ecology Division (MED), Duluth, MN
- 2000(Feb-Jun) Acting Associate Director for Science, USEPA, ORD, NHEERL, Duluth, MN
- 1995-2000 Biochemical and Cellular Toxicology Team Leader; Research Toxicologist, USEPA, ORD, NHEERL, Duluth, MN
- 1990-1995 Research Toxicologist, USEPA, ORD, NHEERL, Duluth, MN
- 1985-1989 Research Aquatic Biologist, USEPA, ORD, NHEERL, Duluth, MN
- 1984-1985 Principal Technician, Department of Pharmacology, University of Minnesota-Duluth, Medical School, Duluth, MN
- 1982-1984 Junior Scientist, Center for Lake Superior Environmental Studies, University of Wisconsin-Superior

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

- Society of Environmental Toxicology and Chemistry
International Society for the Study of Xenobiotics
Society of Toxicology- Northland Chapter

SELECTED AWARDS AND HONORS

- NHEERL Award- Science Integration: developing the NHEERL Safe Pesticides/Safe Products Multi-Year Implementation Plan, 2005
- ORD Science Communications Award: ES&T Ecotoxicology Special Issue Group, 2004
- ORD Computational Toxicology New Start Competed Award: for Simulating Metabolism of Xenobiotic Chemicals as a Predictor of Toxicity, 2004
- NHEERL Award- Science Integration: collaboration across NHEERL health and eco-divisions to investigate the utility of small fish models for use in human health risk assessment, 2003
- ORD Endocrine Disruptor Internal Award Competition: for Xenobiotic Binding to the Estrogen Receptor: A Comparison of Species-Specific Responses Utilizing In Vitro Test Systems and Quantitative Structure-Activity Relationships, 1997
- STAA: TCDD uptake and elimination kinetics of medaka, 1995
- STAA: Honorable Mention, Blood and Water Flow Limitations on Gill Uptake of Organic Chemicals in the Rainbow Trout, 1993

INVITED LECTURES/SYMPOSIA

(Within last 5 years)

- Schmieder, P., S. Bradbury, G. Veith, J. McKim III. Toxicity Pathways to Assessment Endpoints. McKim Conf. on QSARs and Aq. Tox. in Risk Assessment, Duluth, MN, June 27-29, 2006.
- Schmieder, P. Designing a QSAR Model for ER binding. McKim Conf. on QSARs and Aq. Tox. in Risk Assessment,

Duluth, MN, June 27-29, 2006

Hornung, M.W., K.R. Thoenke, J.J. Korte, J.A. Serrano, J.W. Nichols, P.K. Schmieder, J.E. Tietge, and S.J. Degitz. A systems approach to characterizing and predicting thyroid toxicity. McKim Conf. on QSARs and Aq. Tox. in Risk Assessment, Duluth, MN, June 27-29,

Mekenyan, O., P. Schmieder. ER Binding Affinity: QSAR for Mechanistic interpretation, hazard assessment and strategic testing. Invited Plenary: 12th Intl. Workshop on QSAR in Human Health and Environmental Sciences. Lyon, France. May, 2006.

Schmieder, P., Tapper, M. Denny, J., Kolanczyk, R, Sheedy, B, Aladjov, H., Mekenyan, O. 2004. Integrating Toxicity Pathway In Vitro Testing with Advanced Chemical Selection Strategies for Environmental QSAR. Invited presentation: International Workshop: Bourgas, Bulgaria, May 17-20, 2004.

Schmieder, P. Use of Quantitative Structure-Activity Relationships (QSAR) to Predict Chemical Toxicity in Aquatic Organisms. Seminar: Department of Biological Sciences, Brunel University, Uxbridge, UK, May 14, 2004.

Mekenyan, O, Dimitrov, S., Schmieder, P., Veith G. 2003. In silico modelling of hazardous endpoints: Current problems and perspectives. Invited keynote and manuscript. 2nd Intl. Symposium on Computational Methods in Toxicology and Pharmacology Integrating Internet Resources. September 17-19, 2003, Thessalomiki, Greece.

Mekenyan, O., Schmieder, P., Bradbury, S., Veith G. 2002. Prioritization of Large Chemical Inventories for Endocrine Disruptor Testing Using a New 3D QSAR Approach. Invited presentation and manuscript. SCOPE/IUPAC International Symposium on Endocrine Active Substances. Nov. 17-21, 2002. Yokohama, Japan.

Henry, TR, JSDenny, MATapper, Z Nedyalkova, O Mekenyan, P. Schmieder. 2002. Inter-species Comparisons and SAR modeling of Estrogenicity Using Rainbow Trout ER Binding Data. Invited Presentation: Endocrine Disruption Session: 23rd Annual Meeting of Society of Environmental Toxicology and Chemistry. Nov. 16-20, 2002. Salt Lake City, UT

Johnson, RD, P. Schmieder, R.Winn, D. Lothenbach, K Flynn, D Hammermeister, F Whitman, A. DeAngelo, D. Wolf. 2002. Invited Presentation: Medaka Session: 23rd Annual Meeting of Society of Environmental Toxicology and Chemistry. Nov.16-20, 2002. Salt Lake City, UT

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

(Within last 5 years)

2006 – OECD Endocrine Disruptor, Validation Management Group for Non-Animal Testing

2005 - Invited OECD QSAR ER Workgroup - EC, JRC, ECB- June31-July1, Ispra, Italy

2004 - Invited ECVAM Consultation Meeting on Development and Validation of QSARs for ER and AR Binding; EC, JRC, ICHP, ECVAM. Ispra, Italy.

2004 - Invited Workgroup Chair - *In vitro-in vivo* Extrapolations Workgroup:International Workshop on Internal Exposure-Linking bioavailability to effects. EAWAG/University of Utrecht/Swiss Fed. Inst. of Technology. August 22 - 27, 2004, Monte Verità, Switzerland.

2004 - Invited Plenary Speaker: SETAC/SOT Intl Workshop on Emerging Molecular and Computational Approaches for Cross-Species Extrapolations. July 18-22, Portland, OR.

2004 - Invited Presenter- International Training Workshop for OASIS Software Developers and Users. May 17-20, Bourgas, Bulgaria.

2004 – Use of Quantitative Structure-Activity Relationships (QSAR) to Predict Chemical Toxicity in Aquatic Organisms. Department of Biological Sciences, Brunel University, UK

2003 - Steering Committee Chair: International Colloquium on Use of Medaka in Risk Assessments. Sponsor: EPA Risk Assessment Forum, June, 2000. Duluth, MN,

2002 - Predictive Tools for Biodegradation: CATABOL and METI Model. Joint Meeting: Japan (CERI, METI);

Bourgas Univ., Bulgaria; USEPA, Duluth, MN, Nov. 22, 2002, Tokyo, Japan.
2002 - SCOPE/IUPAC International Symposium on Implications of Endocrine Active Substances for Human and Wildlife Species - QSAR Workshop. Nov. 17-21, 2002, Yokohama, Japan.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

2003 - 2006. NHEERL Safe Pesticides/Safe Products Multi-Year Implementation Plan Steering Committee. Co-lead of SP2 LTG1 Workgroup.
2001- 2002. NHEERL Goal 4 " Safe Communities" Implementation Steering Committee –development cross-divisional research plans to meet needs of OPPTS.
2002-2003. 2003 – NHEERL five-division workgroup to develop cross-division initiative to investigate the utility of small fish models for use in human health risk assessment.
2000- 2001. Member NHEERL Infrastructure Steering Committee
1999-2000. Member NHEERL Workgroup - Office of Drinking Water research needs for chemicals on Contaminant Candidate List (CCL-I).

PUBLICATIONS

(selected)

Schmieder, P., Tapper, M, Denny, J., Kolanczyk, R., Sheedy, B, Henry, T, Veith, G. 2004. Use of trout liver slices to enhance mechanistic interpretation of ER binding for cost-effective prioritization of chemicals within large inventories. *Environ Sci Tech.* 38:6333-6342.

Schmieder, P., Mekenyan, O., Bradbury, S., Veith, G. 2003. QSAR Prioritization of Chemical Inventories for Endocrine Disruptor Testing. *Pure Appl. Chem.* Vol 75 (11/12):2389-2396.

Schmieder, P., G. Ankley, O. Mekenyan, J. Walker, and S. Bradbury. 2003. QSAR Models for Predicting ER Binding Affinity of Structurally Diverse Chemicals. *Environ Toxicol Chem-Annual Review Issue.* Vol 22(8):1844-1854.

Schmieder, P., M. Tapper, R. Kolanczyk, D. Hammermeister, B. Sheedy, and J. Denny. 2003. Discriminating Pathways of Reactive Chemical Toxicity Using Isolated Trout Hepatocytes: Redox Cycling and Arylation. *Toxicol Sci.* 72: 66-76.

Schmieder, P.K., Y. Koleva, and O. G. Mekenyan. 2002. A reactivity pattern for discrimination of ER agonism and antagonism based on 3-D molecular attributes. *SAR/QSAR Environ Res.* 13:353-364.

Schmieder, P.K., A.O. Aptula, E. J. Routledge, J.P. Sumpter, and O.G.Mekenyan. 2000. Estrogenicity of Alkylphenolic Compounds: A 3-D Structure Activity Evaluation of Gene Activation. *Environ. Toxicol. Chem.* 19(7):1727-1740.

Schmieder, P., M. Tapper, A. Linnum, J. Denny, R. Kolanczyk and R. Johnson. 2000. Optimization of a Precision-Cut Trout Liver Tissue Slice Assay as a Screen for Vitellogenin Induction: Comparison of Slice Incubation Techniques. ***Aquatic Toxicol.*** 49:251-268.

BIOGRAPHICAL SKETCH

NAME: Brian A. Schumacher POSITION TITLE: Supervisory Physical Scientist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
State University of New York at Buffalo	B.A.	1980	Physical Geography
University of Georgia – Athens	M.S.	1982	Soil Science
University of Georgia – Athens	Ph.D.	1985	Soil Science

PROFESSIONAL EXPERIENCE

Supervisory Physical Scientist. U.S. EPA, NERL. 2/2000 – present.
Environmental Scientist. U.S. EPA, NERL. 6/16/91 to 2/26/00.
Senior Scientist. Lockheed Environmental Systems Company. 1/4/88 to 6/15/91.
Post-Doctoral Research Associate. Louisiana State University. 7/85 to 12/87.
Graduate Research Assistant. University of Georgia – Athens. 9/80 to 6/85.

SELECTED AWARDS AND HONORS

Numerous Sustained Superior Performance awards and honors
U.S. EPA Exemplary Performance (1995)
U.S. EPA Bronze Medal for Commendable Service (1992 and 1994)
U.S. EPA Award of Excellence (1989)

INVITED LECTURES/SYMPOSIA

B.A. Schumacher. 2004. Contaminated Sediment Sampling Methods. Office of Superfund Remediation and Technology Innovation's Contaminated Sediments Seminar Series via phone.

B.A. Schumacher, 2004. Re-evaluation of Applicability of Agency Sample Holding Times. U.S. EPA Biological Advisory Council Meeting via phone.

B.A. Schumacher. 2004. Re-evaluation of Applicability of Agency Sample Holding Times. U.S. EPA Regional Laboratory Director's Meeting. Kansas City, KS.

B.A. Schumacher. 2003. Re-evaluation of Applicability of Agency Sample Holding Times. U.S. EPA Regional Laboratory Director's Meeting. Newport, RI.

PUBLICATIONS

Ainsworth, C.C., B.A. Schumacher, V. I. Cullinan, E. A. Crecelius, K. B. Wagnon, and L. A. Niewolny. 2005. Sample Holding Time Reevaluation. U.S. Environmental Protection Agency, Las Vegas, NV. EPA/600/R-05/124.

Schumacher. B.A. 2005. Report on the Panel Session: Emerging Electronic Issues – How Can We Minimize the Health and Environmental Impacts of Electronics Recycling? U.S. Environmental Protection Agency, Las Vegas, NV. EPA/600/R-05/101.

Schumacher. B.A. 2005. Collection of Undisturbed Surface Sediments: Sampler Design and Initial Evaluation Testing. U.S. Environmental Protection Agency, Las Vegas, NV. EPA/600/R-05/076.

Capri, J., B.A. Schumacher, S. Wenning, E. Smith, J. H. Zimmerman, and J.D. Vanover. 2005. Collection of Undisturbed Surface Sediments: Sampler Design and Initial Evaluation Testing. U.S. Environmental Protection Agency, Las Vegas, NV. EPA/600/R-05/076.

Nocerino, J., B.A. Schumacher, and C.C. Dary. 2005. Role of Laboratory Sampling Devices and Laboratory Subsampling Methods in Optimizing Representativeness Strategies. *Environmental Forensics* 6:35-44.

Capri, J., and B.A. Schumacher. 2003. Literature Review and Report: Surface Sediment Sampler Database. U.S. Environmental Protection Agency, Las Vegas, NV. EPA/600/R-03/115

Schumacher, B.A. 2003. Literature Review and Report: Surface Sediment Sampler Database. U.S. Environmental Protection Agency, Las Vegas, NV. EPA/600/R-03/115.

Hu, Y., J. Beach, B.A. Schumacher, and G. Robertson. 2004. Evaluating Commercially Available Dermal Wipes, Cotton Suites, and Alternative Urinary Collection Materials for Pesticide Sampling from Infants. U.S. Environmental Protection Agency, Las Vegas, NV. EPA/600/R-04/115.

Schumacher, B.S. 2002. Methods for the Determination of Total Organic Carbon (TOC) in Soils and Sediments. U.S. EPA. Ecological Risk Assessment Support Center, Cincinnati, OH. EPA/600/R-02/069.

Schumacher, B.A., J.J. Van Ee, and E.J. Englund. 2002. Soil Sampling for the Characterization of Hazardous Waste Sites. In R.A. Meyers (ed). *Encyclopedia of Analytical Chemistry*. J. Wiley & Sons, Inc. London.

PRESENTATIONS

Hayter, E. and B.A. Schumacher. 2005. Contaminated Sediment Sampling, Transport, and Fate Research. Land BOSC review. Cincinnati, OH.

Schumacher, B.A., J.H. Zimmerman, and J. Nocerino. 2005. Innovations in Soil Sampling and Data Analysis. Land BOSC review. Cincinnati, OH.

Schumacher, B.A., J.H. Zimmerman., D. Siscanaw, R. Maxfield, and G. Dodo. 2005. Advancing Site Characterization and Monitoring Through Client Collaborations. Land BOSC review. Cincinnati, OH.

Schumacher, B.A., C.C. Ainsworth, E.A. Crecelius, and V.I. Cullinan. 2005. Re-evaluation of Applicability of Agency Sample Holding Times. EPA Science Forum. Washington, DC.

NARRATIVE

My work primary research areas have been in examining ways to improve sample collection for soils and sediments. The main focus of the soils work has been on the collection of soils contaminated with volatile organic compounds (VOCs) and improving the techniques for sample collection, handling, storage, and preservation. This work has expanded to include the interests of the Brownfields office within EPA by examining vapor intrusion issues. In the area of contaminated sediments, the emphasis of my research program has been on collection of undisturbed surface sediment layers and being able to collect intact sediment layers as thin as 1 centimeter thick. An innovative sediment sampler has been created for this effort and is currently being tested at contaminated sediment sites. Other areas of my research program have included undertaking Regional Methods Initiative and Regionally Applied Research Effort projects and working directly with the Regions on areas of concern that they have identified. Recently, I have been involved in the methods verification/validation and sampling method efforts for the National Homeland Security Research Center and the National Environmental Monitoring Center.

BIOGRAPHICAL SKETCH

NAME: Nathan Schumaker

POSITION TITLE: Research Ecologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Santa Cruz, Santa Cruz, CA	B.S.	1985	Physics
University of Santa Cruz	B.S.	1985	Mathematics
University of Washington, Seattle, WA	M.S.	1989	Applied Mathematics
University of Washington, Seattle, WA	Ph.D.	1995	Forest Ecosystem Analysis

PROFESSIONAL EXPERIENCE

1996-1997: Assistant Professor, Dept. of Fisheries and Wildlife, Oregon State University, Corvallis, OR

1995-1996: Project Scientist, ManTech Environmental Technologies, Inc., Corvallis, OR

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS:

International Association for Landscape Ecology

Society for Conservation Biology

SELECTED AWARDS AND HONORS

U.S. EPA, 2005. Scientific and Technological Achievement Award (Level III)

U.S. EPA, 2004. Bronze Medal for Commendable Service

INVITED LECTURES/SYMPOSIA

Forecasting population dynamics in changing landscapes. Invited Seminar. University of British Columbia, Vancouver, BC. Canada. October, 2005.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

USDA Forest Service State of the Science Workshop. Portland, Oregon. 2005

Co-Chair, Wildlife Habitats and Species Associations in Oregon and Washington. Washington State Department of Fish and Wildlife. 1998

State of Oregon, Governor's 4(d) Scientific Review Team, 1997

IAI-AMIGO Workshop on Landscape Fragmentation Effects on Faunal Biodiversity in the Americas: Maitencillo, Chile, 1996

Consultant to U.S. Fisheries and Wildlife Department, 1996-1997

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Member, ORD Wildlife Strategy planning group

PUBLICATIONS

McRae B., N.H. Schumaker, R.B. McKane, R.T. Busing, A.M. Solomon, and C.A. Burdick. Incorporating climate change and land use into wildlife risk assessments. In review, *Landscape Ecology*.

Nagy, L.R., and N.H. Schumaker. Habitat specific demographic patterns in western bluebirds in an agricultural landscape. In review, *Journal of Applied Ecology*.

Rustigian, H.L., M.V. Santelmann, and N.H. Schumaker. Assessing the potential impacts of alternative landscape designs on amphibian population dynamics. In: *From the Corn Belt to the Gulf: Ecological and Societal Implications of Alternative Agricultural Futures* Editors: Joan Iverson Nassauer, Mary V. Santelmann, and Donald Scavia. In press.

Carroll C., M. K. Phillips, C. A. Lopez-Gonzalez, and N. H. Schumaker. 2006. Defining recovery goals and strategies

- for endangered species: The wolf as a case study. *Bioscience* 56:25-37.
- Jager, H. I., A. W. King, N. H. Schumaker, T. L. Ashwood, and B. L. Jackson. 2005. Spatial uncertainty analysis of population models. *Ecological Modeling* 185:13-27.
- Baker, J. P., D. W. Hulse, S. V. Gregory, D. White, J. Van Sickle, P. A. Berger, D. Dole, and N. H. Schumaker. 2004. Alternative futures for the Willamette river basin, Oregon. *Ecological Applications* 14:313-324.
- Carroll, C. R. F. Noss, P. C. Paquet, and N. H. Schumaker. 2004. Extinction debt of protected areas in developing landscapes. *Conservation Biology* 18:1110-1120.
- Lawler, J. J., and N. H. Schumaker. 2004. Evaluating habitat as a surrogate for population viability using a spatially explicit population model. *Environmental Monitoring and Assessment* 94:85-100.
- Nalle, D. J., C. A. Montgomery, J. L. Arthur, S. Polasky, and N. H. Schumaker. 2004. Modeling joint production of wildlife and timber. *Journal of Environmental Economics and Management* 48: 997-1017.
- Schumaker, N. H., T. Ernst, D. White, J. Baker, and P. Haggerty. 2004. Projecting wildlife responses to alternative future landscapes in Oregon's Willamette Basin. *Ecological Applications* 14:381-400.
- Carroll, C., M. K. Phillips, N. H. Schumaker, and D. W. Smith. 2003. Impacts of landscape change on wolf restoration success: Planning a reintroduction program using static and dynamic spatial models. *Conservation Biology* 17:536-548.
- Carroll, C., R. F. Noss, P. C. Paquet, and N. H. Schumaker. 2003. Use of population viability analysis and reserve selection algorithms in regional conservation plans. *Ecological Applications* 13:1773-1789.
- Rustigian, H. L., M. V. Santelmann, and N. H. Schumaker. 2003. Assessing the potential impacts of alternative landscape designs on amphibian population dynamics. *Landscape Ecology* 18:65-81.
- Calkin, D. E., C. A. Montgomery, N. H. Schumaker, S. Polasky, J. L. Arthur, and D. J. Nalle. 2002. Developing a production possibility set of wildlife species persistence and timber harvest value. *Canadian Journal of Forest Research* 32:1329-1342.
- Richards, W. H., W. O. Wallin, and N. H. Schumaker. 2002. An analysis of late-seral forest connectivity in western Oregon. *Conservation Biology* 16:1409-1421.
- Schumaker, N. H., T. Ernst, P. Haggerty, J. Baker, and D. White. 2002. Terrestrial Wildlife Populations. In D. Hulse, S. Gregory, and J. Baker (eds), *Willamette River Basin Atlas*, 2nd Edition. Oregon State University Press, Corvallis, OR.
- Carroll, C., R. F. Noss, N. H. Schumaker, and P. C. Paquet. 2001. Is the return of the wolf, wolverine, and grizzly bear to Oregon and California biologically feasible?. In D. Maehr, R. Noss, and J. Larkin, eds. *Large mammal restoration: ecological and sociological challenges in the 21st century*. Island Press, Washington, DC.
- Wilhere, G., and N. H. Schumaker. 2001. A spatially realistic population model for informing forest management decisions. Pages 538-544 in D. H. Johnson, and T. A. O'Neil (eds), *Wildlife-habitat relationships in Oregon and Washington*. Oregon State University Press, Corvallis, OR.
- Schumaker, N. H. 1998. A Users Guide to the PATCH Model. EPA/600/R-98/135. U.S. Environmental Protection Agency, Environmental Research Laboratory, Corvallis, Oregon.
- Schumaker, N. H. 1996. Using landscape indices to predict habitat connectivity. *Ecology* 77:1210-1225.

BIOGRAPHICAL SKETCH

NAME: MaryJane K. Selgrade POSITION TITLE: Chief, Immunotoxicology Branch

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Heidelberg College, Tiffin, Ohio	B.S.	1969	Biology
University of Wisconsin, Madison	M.S.	1971	Medical Microbiology
University of Wisconsin, Madison	Ph.D.	1973	Medical Microbiology

PROFESSIONAL EXPERIENCE

Chief, Immunotoxicology Br., ETD, NHEERL, U.S. EPA, Res. Triangle Pk, NC, 1991-present
Acting Chief, Pulmonary Toxicology. Br., ETD, NHEERL, U.S. EPA, Res. Triangle Pk, NC, 2/02-10/02.
Adjunct Professor, College of Veterinary Science, NC State Univ., Raleigh, NC, 1995-present
Adjunct Professor, Department of Toxicology, NC State Univ, Raleigh 2004-present
Adjunct Professor, Curriculum in Toxicology, Univ. of NC, Chapel Hill, 1998-present
Acting Division Director, ETD, NHEERL, U.S. EPA, 4/98-12/98.
Chief, Immunotoxicology Section, Pulmonary Toxicology Branch , Environmental Toxicology Div., Health Effects Research Laboratory, U.S. EPA, Res. Triangle Pk, NC, 1983-1991.
Adjunct Associate Professor, Depart. of Parasitology and Laboratory Practice, School of Public Health, Univ. of NC, Chapel Hill, 1983-1988.
Research Microbiologist, Inhalation Toxicology Branch, Health Effects Research Lab, U.S. EPA, Research Triangle Park, NC, 1979 -1983.
Visiting Asst. Professor, Dept. of Microbiology, N.C. State Univ., Raleigh, NC, 1976-1979.
Postdoctoral Fellow, Dept. Bacteriology, Univ. North Carolina, Chapel Hill, NC, 1974-1976.
NRC Research Assoc., Dept. Experimental Immunology, Naval Med. Res. Inst., Bethesda, MD, 1974-76

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Soc. of Toxicology (SOT), Amer. Soc. for the Advancement of Science
Vice President (VP) elect, then VP, then President Immunotoxicology Specialty Section, SOT, 1999-2002
Vice President (VP) elect, then VP, then President Inhalation Specialty Section, SOT, 2003-2006.
Associate Editor for Toxicological Sciences (2002-present), Editorial Board for J.Immunotoxicology (2004-present)
Society of Toxicology Program Committee 1998-2001

SELECTED AWARDS AND HONORS

Recipient Career Achievement Award, Immunotoxicology Specialty Section, Society of Toxicology
Recipient EPA Science and Technologic Achievement Awards 1988 and 2000
Recipient Research Paper of the Year Award from the Inhalation Specialty Section, Society of Toxicology, 1995
Recipient EPA Bronze Medals for Developing & harmonizing immunotoxicity testing guidelines, 1999; Toxic mold research, 2003; Advancement of EPA's ability to evaluate the safety of plant incorporated protectants, 2006.

INVITED LECTURES/SYMPOSIA

(Recent)

Application of Murine Models of Respiratory Allergy to Environmental Problems, Health Canada Workshop, Animals Models to Detect Allergenicity to Foods and GM Products, Ottawa, 11/01
Biotechnology Research Priorities for U.S. Environmental Protection Agency, International Life Sciences (ILSI) meeting on Activities Related to Biotechnology, Washington, DC 11/02.
Cytokine Profiling: A Genomic/Proteomic-Like Approach to Identifying Respiratory Sensitizers. Laboratory of Respiratory Biology Seminar Series, Nat'l Inst. Environmental Health Sciences, Res.Tri. Pk, NC. Apr., 2004
Asthma research at EPA's Nat'l Health & Environmental Effects Research Lab: Environmental Risk Factors For

Asthma, Science of Environmental Justice Working Conference, Boston, MA, May 2004.
Respiratory Hypersensitivity, Regulatory Perspective, Proteins, International Life Sciences (ILSI) Respiratory Hypersensitivity Workshop, Washington, DC, June 2004
Immune System Biomarkers, Agricultural Health Study Biomarker Workshop on Cancer Etiology, Chapel Hill, NC March 2, 2005
Immunotoxicity of Inhaled Compounds: Immune Suppression and Hypersensitivity. Toxicology and Risk Assessment Conference, Dayton, OH, April 26, 2005
Lecturer Advanced Tox., University of NC, 1997-present; Immunotox. Course NY University, 1997, 1999, 2004; Biochemical Tox. 1997, 1999-present, and General Tox. 2001-present, NC State University, Mammalian Toxicology, Duke University, 2003, 2006

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Grants Reviewed for Air Force Office of Science Research 1997, 2000, 2002
Science Advisory Panel, Mickey Leland National Urban Air Toxics Research Center 1997-2003.
Organized Immunotoxicology course taught in graduate school at North Carolina State University, 1999, 2004, 2006
World Health Org., Program Committee Internat'l Workshop on Skin Sensitization in Chemical Risk Assessment, 2006
External Advisory Board, Nat'l Food Safety and Toxicology Center, Michigan State University 2005-2007

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

NHEERL Asthma Implementation Team; Briefing of Administrator Asthma Research Highlights, 2005
NHEERL Safe Pesticides Safe Products (SP2) Implementation Team

PUBLICATIONS

(Selected from January 1, 2000 to present, out of a career total of 112):

Ward, M.D.W., Madison, S.L., Sailstad, D.M., Gavett, S.H. Selgrade, M.J.K. Allergen-triggered airway hyperresponsiveness and lung pathology in mice sensitized with the biopesticide, *Metarhizium anisopliae*, by BALB/c mice. *Toxicology* 143:141-154, 2000.
Selgrade, M.J.K., Lambert, A.L., Ward, M.D.W., Gilmour, M.I. Animal models to assess effects of air pollutants on allergic lung disease. *Annals NY Acad. Sci.* 919:230-238, 2000.
Selgrade, M.J.K., Smith, M.V., Oberhelman-Bragg, L.J., LeVee, G.J., Koren, H.S., Cooper, K.D. Dose response for uv-induced immune suppression in people of color: differences based on erythral reactivity rather than skin pigmentation. *Photochem. Photobiol.* 74:88-95, 2001.
Ryan, L.K., Bishop, L.R., Daniels, M.J., Costa, E.R., Selgrade, M.J.K. Role of proinflammatory and Th-1 cytokines in the enhancement of disease due to influenza infection in BALB/c mice exposed to ultraviolet radiation. *Toxicol Sciences* 67:88-97, 2002.
Plitnick, L.M., Loveless, S.E., Ladics, G.S., Holsapple, M, Selgrade, M.J.K., Sailstad, D.M. Smialowicz, R.J. Cytokine Profiling for Chemical Sensitizers: Application of the Ribonuclease Protection Assay and Effect of Dose. *Toxicol. Appl. Pharmac.* 179(3):145-54, 2002.
Viana, M.E., Coates, N.H., Gavett, S.H., Selgrade, M.J.K., Vesper, S.J., Ward, M.D.W. An extract of *Stachybotrys chartarum* causes allergic responses in a BALB/c mouse model. *Toxicol. Sci.* 70: 98-109, 2002.
Selgrade, MJK, Kimber, I., Goldman, L, Germolec, D.R. Assessment of allergenic potential of genetically modified foods: An agenda for future research. *Environmental Health Perspect.* 111:1140-1141, 2003
Sailstad, D.M., Ward, M.D.W., Boykin, E.H., Selgrade, M.J.K. A murine model for low molecular weight chemicals: differentiation of respiratory sensitizers (TMA) from contact sensitizers (DNFB). *Toxicology* 194:147-161, 2003
Selgrade, M.J.K. . Immune System In A Textbook of Modern Toxicology, 3rd Edition (E. Hodgson, editor), J. Wiley & Sons, NY, NY, pp.327-342, 2004
Plitnick, LM, S.E. Loveless, G.S. Ladics, M.P. Holsapple, R.J. Smialowicz, M.R. Woolhiser, P.K. Anderson, C. Smith, D.M. Sailstad, M.J.K. Selgrade. Cytokine mRNA profiles for isocyanates with known and unknown potential to induce respiratory sensitization. *Toxicology* 207:487-499, 2005
Selgrade, M.J.K. Biomarkers of effects the immune system. *J.Biochem. & Molec. Toxicol.* 19: 177-179, 2005.
Ward, MDW and Selgrade, MJK. Benefits and risks in malaria control. *Science* 310:49, 2005.

- Selgrade MJK, Lemanske RF, Gilmour MI, Neas LM, et al., Induction of Asthma and the Environment: What We Know and Need to Know. *Environmental Health Perspectives*. 114: 615-619, 2006
- Holsapple, M., Jones, D., Kawabata, T, Kimber, I, Sarlo, K., Selgrade, M., Shah, J., Woolhiser, M. REVIEW: Assessing the Potential to Induce Respiratory Hypersensitivity. *Tox Sci*. 91:4-13, 2006.
- Selgrade, M.J.K. and M.I. Gilmour. Immunotoxicology of inhaled compounds - Assessing risks of local immune suppression and hypersensitivity. *J. Toxicol. Environ. Health Part A* 69:827-844, 2006
- Selgrade, M.J.K, Boykin, E.H., Haykal-Coates, N., Woolhiser, M.R., et al., *Toxicol. Sci.* Cytokine profiles do not predict antibody responses and respiratory hyperresponsiveness following dermal exposure to isocyanates. *Toxicological Sciences*. In Press.
- Selgrade, MJK and BJ Meade (2006) *Allergy to Chemicals and Proteins: An Introduction*. In *Immunotoxicology and Immunopharmacology*, 3rd edition (M.I. Luster, B.L. Luebke, I. Kimber, eds), CRC Press

BIOGRAPHICAL SKETCH

NAME: R. Woodrow Setzer

POSITION TITLE: Mathematical Statistician

EDUCATION/TRAINING

Institution	Degree	Year	Field Of Study
University of Chicago, Chicago, Illinois	B.A.	1974	Mathematics
SUNY at Stony Brook, Stony Brook, New York	Ph.D.	1983	Population Biology
University of North Carolina, Chapel Hill	post-doc	1987	Biostatistics

PROFESSIONAL EXPERIENCE

Mathematical Statistician, NCCT, ORD, EPA	2005 – present
Mathematical Statistician, PKB, ETD, NHEERL, ORD EPA	2002 – 2005
Mathematical Statistician, BRSS, NHEERL, ORD	1993 – 2002
Health Scientist, HERL, ORD EPA	1989 – 1993
Postdoctoral Fellow, DTD, HERL, ORD EPA	1987 – 1989
Postdoctoral Fellow, Department of Biostatistics, School of Public Health, University of North Carolina, Chapel Hill, NC	1984 – 1987
Lecturer, Department of Ecology and Evolution, State University of New York, Stony Brook, NY	1984

SELECTED AWARDS AND HONORS

- Level I USEPA Science and Technology Achievement Award for BBDR Modeling of the Developmental Toxicity of 5-FU, 1994
- Level III USEPA Science and Technology Achievement Award for Dose-Response Relationship in Multi-stage Carcinogenesis, 1994
- Honorable Mention, USEPA Science and Technology Achievement Award for A New Mechanism for the Exogenous Mitigation of 5-Fluorouracil-Induced Toxicity, 1997
- USEPA Silver Medal for the Organophosphate Cumulative Risk Assessment, 2003
- USEPA Bronze Medal for Commendable Service for Development of Benchmark Dose Software, 2004
- USEPA Silver Medal for Scientific Workgroups for EPA's Guidelines for Carcinogen Risk Assessment and Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens, 2006

INVITED LECTURES/SYMPOSIA

- Risk Assessment Using EPA Benchmark Dose Software Version 1.2. A full day workshop presented (with J. Gift) at the annual meeting of the Society for Risk Analysis, December 5, 1999
- Calculating and Using Benchmark Doses (BMD). Federal/State Toxicology and Risk Analysis Committee, May 21–23, 2001.
- Populations and PK Models. NERL/NHEERL Exposure to Dose Modeling Workshop, Research Triangle Park, NC, July 10–11, 2001.
- Basic Statistical Analysis of Developmental Toxicity Studies, in Experimental Design and Biostatistics, a mini-education course at the annual meeting of the Teratology Society, Scottsdale, AZ, June 25, 2002.
- Use of NOAEL, benchmark dose, and other models for human risk assessment of hormonally active substances. SCOPE/IUPAC International Symposium on Endocrine Active Substances, Yokohama, Japan, November 17–21, 2002.
- Cumulative Risk Analysis for Organophosphorus Pesticides. Society of Toxicology, Salt Lake City, UT, March 9–13, 2003.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Adjunct Associate Professor, Department of Biostatistics, University of North Carolina at Chapel Hill School of Public Health, 2000 – present
Member, Editorial Board, *Toxicology Methods*, 1994 – 1998
President-Elect, Research Triangle Chapter, Society for Risk Analysis, 2001 – 2002
Chair, Research Triangle Chapter, Society for Risk Analysis, 2002 – 2003
Affiliate Member of the Biostatistics and Epidemiological Methods Facility Core, University of North Carolina at Chapel Hill Center for Environmental Health and Susceptibility
ILSI HESI Dose Dependent Transitions in Mechanisms of Toxicity Committee 2002 – 2003.
Invited Participant, WHO/IPCS Author’s Workshop on Dose-Response Modeling, Geneva, Switzerland, 2004
Invited Participant, EFSA/WHO International Conference, “Risk Assessment of Compounds that are both Genotoxic and Carcinogenic” Brussels, Belgium, 16 – 18 November, 2005

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Planning Committee and epidemiology session Chair Mn/MMT Workshop held in Research Triangle Park, NC, March 12–15, 1991
Co-Chair, Organizing Committee for the First HERL Symposium: *Biological Mechanisms and Quantitative Risk Assessment*, 1992 – 1993.
IRIS RfD/C Committee, 1994–1995
Chair, Risk Assessment Forum Technical Panel, Benchmark Dose Technical Guidance Document, 1998 – 2005
Statistical Consultant/Collaborator with the National Center for Environmental Assessment for Development of EPA’s Benchmark Dose Software. 1993 – present.
Co-Chair, International Workshop on Uncertainty and Variability in Physiologically Based Pharmacokinetic Models (2006 – present; workshop scheduled Oct 31 – Nov 2, 2006).
Member, NCEA Statistical Working Group (2005 – present).
Member, ORD Information Technology Improvement Project Working Group (2006).

PUBLICATIONS

(Selected from 47 peer-reviewed publications)

1. Scheerer JB, Xi L, Knapp GW, Setzer RW, Bigbee WL, and Fuscoe JC (1999) Quantification of Illegitimate V(D)J Recombinase-Mediated Mutations in Lymphocytes of Newborns and Adults. *Mutation Research*. 431: 291-303.
2. Hurst CH, DeVito MJ, Setzer RW, and Birnbaum LS (2000) Acute Administration of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD) in Pregnant Long Evans Rats: Association of Measured Tissue Concentrations with Developmental Effects. *Toxicological Sciences* 53: 411-420.
3. Lau C, Andersen ME, Crawford-Brown D, Kavlock RJ, Kimmel CA, Knudsen TB, Muneoka K, Rogers JM, Setzer RW, Smith G, and Tyl R (2000). Evaluation of Biologically Based Dose-Response Modeling for Developmental Toxicity: A Workshop Report. *Regulatory Toxicology and Pharmacology*, 31: 190–199.
4. DeWoskin RS, Barone S Jr., Clewell HJ, Setzer RW (2001) Improving the development and use of biologically based dose response models (BBDR) in risk assessment. *Human and Ecological Risk Assessment*, 6: 1091 – 1120.
5. Lau C, Mole ML Copeland MF, Rogers JM, Kavlock RJ, Shuey DL, Cameron AM, Ellis DH, Logsdon TR, Merriman J, and Setzer RW (2001) Toward a biologically based dose-response model for developmental toxicity of 5-fluorouracil in the rat: Acquisition of experimental data. *Toxicological Sciences*, 59: 37–48.
6. Setzer RW, Lau C, Mole ML, Copeland FM, Rogers JM, and Kavlock RJ (2001). Toward a biologically-based dose-response model for developmental toxicity of 5-fluorouracil in the rat: a mathematical construct. *Toxicological Sciences*, 59: 49–58.
7. Shaughnessy DT, Setzer RW, and DeMarini DM (2001). Effect of the antimutagens vanillin and cinnamaldehyde on the spontaneous mutation spectra of Salmonella TA104. *Mutation Research*, 480–481: 55–69.
8. Wubah JA, Setzer RW, and Knudsen TB (2001). Exposure-disease continuum for 2-chloro-2'-deoxyadenosine (2CdA), a prototype ocular teratogen. 1. Dose-response analysis. *Teratology*, 64: 154–169.
9. Lau C, Narotsky MG, Lui D, Best D, Setzer RW, Mann PG, Wubah JA, and Knudsen, TB (2002). Exposure-disease continuum for 2-chloro-2'-deoxyadenosine (2-CdA), a prototypet teratogen: Induction of

- lumbar hernia in the rat and species comparisons for the teratogenic responses. *Teratology* 66: 6–18.
10. Knapp GW, Setzer RW, Fuscoe JC (2003). Quantitation of aberrant interlocus T-cell receptor rearrangements in mouse thymocytes and the effect of the herbicide 2,4-dichlorophenoxyacetic acid. *Environmental Molecular Mutagenesis*, 42: 37–43.
 11. Rogers JM, Setzer RW, Branch S, Chernoff N (2004). Chemically induced supernumerary lumbar ribs in CD-1 mice: size distribution and dose response. *Birth Defects Research*, 71: 17–25.
 12. Smialowicz RJ, Burgin DE, Williams WC, Diliberto JJ, Setzer RW, Birnbaum LS (2004). Xyp1A2 is not required for 2,3,7,8-tetrachlorodibenzo-*p*-dioxin-induced immunosuppression. *Toxicology*, 197, 15–22.
 13. Slikker W, Andersen ME, Bogdanffy MS, Bus JS, Cohen SD, Conolly RB, David RM, Doerrer NG, Dorman DC, Gaylor DW, Hattis D, Rogers JM, Setzer RW, Swenberg JA, Wallace K (2004). Dose-dependent transitions in mechanisms of toxicity. *Toxicology and Applied Pharmacology*, 201: 203 -- 225.
 14. Slikker W, Andersen ME, Bogdanffy MS, Bus JS, Cohen SD, Conolly RB, David RM, Doerrer NG, Dorman DC, Gaylor DW, Hattis D, Rogers JM, Setzer RW, Swenberg JA, Wallace K (2004). Dose-dependent transitions in mechanisms of toxicity: case studies. *Toxicology and Applied Pharmacology*, 201: 226 – 294.
 15. Barton HA, Cogliano VJ, Flowers L, Valcovic L, Setzer RW, Woodruff TJ (2005). Assessing Susceptibility from Early-Life Exposure to Carcinogens. *Environmental Health Perspectives*, 113: 1125 – 1133.

BIOGRAPHICAL SKETCH

NAME: Timothy J. Shafer

POSITION TITLE: Toxicologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Hope College, Holland, MI	B.S.	1986	Biology/Chemistry
Michigan State University	Ph.D.	1991	Pharmacol/Toxicol

PROFESSIONAL EXPERIENCE

1995-present Toxicologist, Neurotoxicology Division, USEPA
April-July 2000 Acting Chief, Neurophysiological Toxicology Branch, NTD, USEPA
1991-1995 Postdoc, Cellular and Molecular Toxicology Branch, NTD, USEPA

PROFESSIONAL SOCIETIES AND PUBLICATIONS BOARDS

Society of Toxicology
International Neurotoxicology Association
Editorial Board, *Toxicology and Applied Pharmacology*
Editorial Board, *Neurotoxicology*

INVITED LECTURES/SYMPOSIA

(selected from 19 total)

March, 2003 *Unfolding the secrets in culturing brain cells: theory, techniques and beyond.* Continuing Education Course at the 2003 Society of Toxicology Meeting. Salt Lake City, UT

October 2003 Interactions of toluene and perchloroethylene with neuronal ion channels: adding a mechanistic component to an Exposure-Dose-Response Model for solvents. Seminar to Department of Biomedical Sciences, Iowa State University, Ames, IA..

April 2004 Disruption of high voltage activated calcium channels by environmental agents- Implications for developmental function. Symposium presentation at Experimental Biology Annual Meeting, Washington, D.C.

September 2004 Effects of volatile organic solvents on neuronal ion channels: improving animal to human extrapolations. Seminar to Purdue University School of Health Sciences. West Lafayette, IN.

February 2006, Cellular and Molecular Approaches to Providing Scientific Information for Neurotoxicity Risk Assessment. Seminar to the OPPTS, U.S. Environmental Protection Agency, Washington, DC.

February 2006, Solvent neurotoxicity and ion channel function. Seminar to the Neuroscience Program, Michigan State University.

ASSISTANCE TO THE SCIENTIFIC COMMUNITY

2000-2003 Advisory Committee to Michigan State University Institute for Environmental Toxicology Superfund Grant

2000-2004 1) Society of Toxicology Program Committee
2) NIH ALTX3 Study Section-Member

2005 1) *Ad hoc* reviewer, Council for the Earth and Life Sciences, NWO, The Netherlands.
2) *Ad hoc* reviewer, NIH/NIEHS Special Emphasis Panel SRG 2006/01 ZES1 JAB-C (Superfund Grants)

2006 1) *Ad hoc* reviewer, Research Grant to United States-Israel Binational Agricultural Research and

Development Fund

2) Reviewer, NIH Center for Scientific Review Special Emphasis Panel, ZRG1 IFCN-A(02)

ASSISTANCE TO THE AGENCY

2003 Review NESHAP Mercury Cell Chlor-Alkali Plants Rule for OAR
2004 Review and Comment on EPA Mercury Action Plan
2006 NHEERL Health Research Labs Revisioning Committee

PUBLICATIONS

(from 45 total peer-reviewed publications, chapters and proceedings)

- Inglefield, J.R. and Shafer, T.J. Perturbation by Arochlor 1254 of GABA_A receptor-mediated calcium and chloride responses during maturation in vitro of rat neocortical neurons. *Toxicol. Appl. Pharmacol.* **164**, 184-195, 2000.
- Shafer, T.J. Methylmercury effects on ion channels and electrical activity in neurons: Future directions. *Cellular and Molecular Biology* **46**, 855-864, 2000.
- Inglefield, J.R. and Shafer, T.J. Polychlorinated biphenyl-stimulation of Ca²⁺ oscillations in developing neocortical cells: role of excitatory transmitters and L-type voltage-sensitive Ca²⁺ channels *J. Pharmacol. Exp. Ther.* **295**, 105-113, 2000.
- Moser, V.C., Shafer, T.J., Ward, T.R., Meacham, C.A., Harris, M.W., and Chapin, R.E. Neurotoxicological outcomes of perinatal heptachlor exposure in rats. *Tox. Sci.* **60**, 315-326, 2001.
- Inglefield, J.R., Mundy, W.R., and Shafer, T.J. Intracellular Ca²⁺ release, store-operated Ca²⁺ influx, and CREB phosphorylation induced in response to exposure of immature cortical cells to a PCB mixture and ortho-substituted PCB congeners. *J. Pharmacol. Exp. Ther.* **297**, 762-773, 2001.
- Tillar, R., Shafer, T.J. and Woodward, J.J. Toluene inhibits voltage-sensitive calcium channels expressed in pheochromocytoma cells. *Neurochemistry International* **41**, 391-397, 2002.
- Shafer, T.J., Meacham, C.A. and Barone, S. Effects of subacute exposure to nanomolar concentrations of methylmercury on voltage-gated sodium and calcium currents in PC12 cells. *Dev. Brain Research* **136**, 151-164, 2002.
- Inglefield J.R., Mundy, W.R. Meacham, C.A. and Shafer, T.J. Identification of calcium-dependent and -independent signaling pathways involved in polychlorinated biphenyl-induced CREB phosphorylation in developing cortical neurons. *Neuroscience* **115**, 559-573, 2002.
- Meacham, C.A., White, L., Barone, S. Jr., and Shafer, T.J. Ontogeny of voltage-sensitive calcium channel α_{1A} and α_{1E} subunit expression and synaptic function in rat central nervous system. *Dev. Brain Res.* **142**, 47-65, 2003.
- Shafer, T.J. and Meyer, D. Effects of pyrethroids on voltage-sensitive calcium channels: an assessment of strengths, weaknesses, data needs, and relationship to assessment of cumulative neurotoxicity. *Toxicol. Appl. Pharmacol.* **196**, 303-318, 2004.
- Meyer, DA and Shafer, TJ. Summary of the current state of knowledge concerning the role of chloride permeable channels in the neurotoxicity of pyrethroid insecticides. EPA/600/X04/086. August 2004. EPA internal report (peer reviewed).
- Bushnell, P.J., Shafer, T.J., Bale, A.S., Boyes, W.K., Simmons, J.E., Eklund, C., and Jackson, T. Development and applications of an exposure-dose-response model for the acute neurotoxicity of organic solvents. *Env. Toxicol. Pharmacol.* **19**, 607-614, 2005
- Bale, A.S., Meacham, C.A., Benignus, V.A., Bushnell, P.J., and Shafer, T.J. Volatile organic compounds inhibit human and rat neuronal nicotinic acetylcholine receptors expressed in *Xenopus* oocytes. *Toxicol. Appl. Pharmacol.* **205**, 77-88, 2005.
- Meacham, C.A., Freudenrich, T.M., Anderson, W.L., Sui, L., Barone Jr., S., Gilbert, M.E., Mundy W.R., and Shafer, T.J. Accumulation of the persistent environmental toxicants methylmercury or polychlorinated biphenyls in *in vitro* models of rat neuronal tissue. *Toxicol. Appl. Pharmacol.* **205**, 177-187, 2005.
- Shafer, T. J., Meyer, D., and Crofton, K.M. Developmental neurotoxicity of pyrethroid insecticides: review and future research needs. *Env. Health Perspect.* **113**, 123-136, 2005.
- Harrill, J.A., Meacham, C.A., Shafer, T.J., Hughes, M.F., and Crofton, K.M. Time and concentration-dependent accumulation of [³H]-deltamethrin in *Xenopus laevis* oocytes. *Tox. Lett.* **157**, 79-88, 2005
- Shafer, T.J. Bushnell, P.J., Benignus, V., and Woodward, J.J. Perturbation of voltage-sensitive Ca²⁺ channel function

- by volatile organic solvents. *J. Pharmacol. Exp Ther.* **315**, 1109-1118, 2005.
- Bale, A.S. Adams, T.L., Bushnell, P.J., Shafer, T.J., and Boyes, W.K. Role of NMDA, nicotinic, and GABA receptors in the steady-state visual-evoked potential in rats. *Pharmacol Biochem Behav*, 82, 635-645, 2005.
- Bushnell, P.J. Boyes, W.K., Shafer, T.J., Bale, A.S., and Benignus, V.A. Approaches to extrapolating animal toxicity data on organic solvents to public health. *NeuroToxicology*, In Press, 2006 (available as epub).
- Meyer, D., and Shafer, T.J. Permethrin, but not deltamethrin, increases spontaneous glutamate release from hippocampal neurons in culture. *NeuroToxicology* 27, 594-603, 2006.

BIOGRAPHICAL SKETCH

NAME: Tamotsu Shiroyama, B.S.

POSITION TITLE: Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Oregon State University, Corvallis	B.S.	1969	Microbiology

PROFESSIONAL EXPERIENCE

1988-2006: Biologist, USEPA, Corvallis.

1970-1988: Microbiologist, USEPA, Corvallis.

1966-1970: Physical Science Technician & Biological Lab Technician, US Dept. of the Interior Federal Water Pollution Control Adm. Corvallis.

PUBLICATIONS

Watrud, L.S., Misra, S., Gedamu, L., Shiroyama, T., Maggard, S. and G. DiGiovanni. 2006. Ecological risk assessment

of alfalfa (*Medicago varia* L.) engineered to express a human metallothionein (hMT) gene. *Water, Air and Soil Pollution*. DOI: 10.1007/s11270-006-9171-5.

Watrud, L.S., Maggard, S., Shiroyama, T., Coleman, D.G., Johnson, M.G., Donegan, K.K., DiGiovanni, G., Porteous,

A.L., and E.H. Lee. 2003. Bracken (*Pteridium aquilinum* L.) frond biomass and rhizosphere microbial community characteristic are correlated to edaphic factors. *Plan and Soil* 249:359-371.

Hobbie, Erik A., Lidia S. Watrud, Sharon Maggard, Tamotsu Shiroyama, Paul T. Rygielwicz. 2003. Carbohydrate use and assimilation by litter and soil fungi assessed by carbon isotopes and BIOLOG assays. *Soil Biol & Biochem* 35:303-311.

Donegan, K.K., L.S. Watrud, R.J. Seidler, S.P. Maggard, T. Shiroyama, L.A. Porteous, and G. DiGiovanni. 2001. Soil

and litter organisms in Pacific northwest forest under different management practices. *Appl. Soil Ecol.* 18:159-175.

Fairbrother, A., Landis, W.G., Dominques, S., Shiroyama, T., Buchholz, P., Roze, M.J., and Matthews, G.B. 1998. A

novel nonmetric multivariate approach to the evaluation of biomarkers in terrestrial field studies. *Ecotoxicology* 7, 1-10.

Bennett, R.S., Bentley, R., Shiroyama, T., and Bennett, J.K. 1990. Effects of the duration and timing of dietary methyl

parathion exposure on bobwhite reproduction. *Environ. Toxicol. Chem.* 7, 1472-1480.

Larson, D.P., F. DeNoyelles, Jr., F.S. Stay, and T. Shiroyama. 1986. Comparisons of single-species microcosm, and experimental pond responses to atrazine exposure. *Environ. Toxicol. Chem.* 5, 179-190.

BIOGRAPHICAL SKETCH

NAME: Ralph J. Smialowicz

POSITION TITLE: Microbiologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Seton Hall University	B.S.	1968	Biology
St. John's University		1970	Biology
University of North Carolina, Chapel	M.S.	1974	Bacteriology &
	Ph.D.		Immunology

PROFESSIONAL EXPERIENCE

NHEERL /ETD/ITB, Research Triangle Park, N.C.
1974-2006

ADJUNCT APPOINTMENTS

1990-present Associated Professor, Curriculum in Toxicology, School of Public Health, University of North Carolina, Chapel Hill, NC

1998-present Associate Professor, Department of Microbiology, Pathology, and Parasitology, College of Veterinary Medicine, North Carolina State University

PROFESSIONAL SOCIETIES

American Association of Immunologists, Society of Toxicology
Editorial Board: Toxicology

SELECTED AWARDS AND HONORS

EPA Bronze Medal for participation in the development of pesticide immunotoxicity test guidelines, Office of Pesticide Programs (1999).

EPA Bronze Medal for "Promoting Strong Science in Agency Decisions", Office of Research and Development (2003).

INVITED LECTURES/SYMPOSIUM

(Selected)

"The Immunotoxicology of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin", Immunology Seminar Series, Department of Microbiology, Pathology, and Parasitology, College of Veterinary Medicine, North Carolina State University, Raleigh, N.C. (1999).

"Developmental Immunotoxicology", Mechanisms of Immunotoxicology 14th Annual Conference, NIOHS, Morgantown, WV, (1999).

"Acute and Persistent Immunotoxicity of Polychlorinated Aromatic Hydrocarbons and Organochlorine Pesticides", Hazardous Waste Toxicology Seminar Series, The Institute for Comparative and Environmental Toxicology, Cornell University (1999).

"The International Collaborative Immunotoxicity Study (ICICIS): A Précis of the Results and Conclusions", International Symposium: Approaches to Risk Assessment of Immunotoxic Effects of Chemicals, Berlin, Germany (1999).

Immunotoxicity Testing and Risk Assessment: Needs of the Risk Assessor", International Symposium: Approaches to

Risk Assessment of Immunotoxic Effects of Chemicals, Berlin, Germany (1999).

"Effect of Perinatal/Juvenile Exposure to Heptachlor on Adult Immune Function", Hawaii Heptachlor Research and

- Education Foundation, Poipu, Hawaii (2000).
- “The Rat as a Model in Developmental Immunotoxicology”, ILSI, Health and Environmental Sciences Institute, Workshop on Developmental Immunotoxicity and Risk Assessment, Washington, DC (2001).
- “Developmental Immunotoxicity in Rats Exposed to Industrial and Agricultural Chemicals”, Department of Microbiology and Immunology, West Virginia University, Morgantown, W.V (2001).
- “Review of the Developmental Immunotoxicology Database”, NIEHS Sponsored Developmental Immuno-toxicology Workshop, Washington, DC (2001).
- “Effects of Xenobiotics on Developmental Immunotoxicology in the Rat.”, International Workshop: Children as a Special Subpopulation: Focus on Immunotoxicity, Berlin, Germany (2001).
- “*In Utero* and Postnatal Development of the Immune System”, Teratology Society, Scottsdale, AZ (2002).
- “Developmental Immunotoxicology”, SOT Contemporary Concepts in Toxicology Meeting, Workshop on Non-Clinical Safety Evaluation of Preventive Vaccines: Recent Advances and Regulatory Consideration, Washington, DC (2002).

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

- IPCS/UNEP/WHO International Collaborative Immunotoxicity Work Group (1999).
- Expert peer reviewer of the LLNA, ICCVAM (1999).
- Co-Organizer, “Mechanisms of Immunotoxicology” Annual Conference (1999).
- ILSI, Framework for Assessing Children’s Risks: Work Planning Committee (2000-2002).
- Co-Organizer/Chair, SOT Symposium, “The Developing Immune System: A Sensitive Target for Perturbation by Xenobiotics (2001).
- Immunity, Infection and Vaccines Working Group of the National Children’s Study (NICHD, NIEHS, CDC, and U.S. EPA (2002).

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

- OPTS Workgroup to Develop Immunotoxicity Test Guide Lines (1998).
- Manager/Author, Chapter 4, Immunotoxicity, EPA Health Assessment for 2,3,7,8-Tetrachlorodibenzo-p-Dioxin and Related Compounds.
- Science Team, ORD Strategy on Risks to Children (2001).
- Technical Qualifications Board, NHEERL (2002).
- ORD Perchlorate Risk Assessment Review Team (2004).
- ORD Human Health Risk Research Strategy Workgroup (1999).
- Children’s Health Test Battery Workgroup, American Industrial Health Council (1999).
- Chapter Manager. Immunotoxicity of PCBs: NCEA Review of the Immunotoxicology of PCB Congeners and Congener Mixtures (2000)).
- EPA Science Forum presentation, “Partnerships to Improve Immunotoxicity Testing” (2005).
- Co-organizer of U.S.EPA Immunotoxicogenomics Workshop (2005).

PUBLISHED SCIENTIFIC PAPERS

83

PUBLISHED BOOK CHAPTERS

14

BIOGRAPHICAL SKETCH

NAME: Mark J. Strynar

POSITION TITLE: Physical Scientist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Rhode Island	B.S.	1993	Natural Resource
Texas A&M University	M.S.	1997	Sciences
The Pennsylvania State University	Ph.D.	2002	Soil Science Soil Science

PROFESSIONAL EXPERIENCE

December 2005 – present Physical Scientist Researcher at the USEPA National Exposure Research Laboratory (NERL), Methods Development and Application Branch (MDAB)

December 2002-2005 Postdoctoral Researcher at the USEPA National Exposure Research Laboratory (NERL), Methods Development and Application Branch (MDAB)

1999-2002 Graduate Research Fellowship, Laboratory of Soil Biochemistry, (Dr. J-M. Bollag, Dr. K. Freeman)The Pennsylvania State University.

1997-1999 Graduate Research Assistantship, Laboratory of Soil Biochemistry, (Dr. J-M. Bollag) The Pennsylvania State University.

1994-1997 Graduate Research/Teaching Assistantships, Laboratory of Soil Microbiology (Dr. R.W. Weaver), Texas A&M University.

1993-1994 Soil and Water Resources Consultant, The University of Rhode Island. Under guidance of Dr. W. Wright and G. Loomis.

1993 Undergraduate Teaching Assistant, The University of Rhode Island. Under guidance of Dr. J. Amador.

1992-1993 Intern, The Natural Resource Conservation Services (NRCS) (Formerly The Soil Conservation Services), Hope Valley, Rhode Island.

Summer 1992 Volunteer, The Soil Conservation Services. Assisted in surveying for ongoing projects. Drafted blueprints for ongoing and future projects.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Member of the Soil Science Society of America

Member of the Golden Key National Honor Society

Member of the Phi Kappa Phi Honor Society

Member of the Gamma Sigma Delta Honor Society

Reviewer for the Journal of Environmental Monitoring

SELECTED AWARDS AND HONORS

North East Collegiate Soil Judging Competition Individual High Score (1993)

Recipient of the North East Branch American Society of Agronomy Outstanding Senior Award (1993)

EPA Time off award for volunteering for the EPA/Shaw University Research Apprenticeship Program (2004)

EPA “S”-Award Superior Accomplishment Recognition (2004)

EPA “T”-Award Team Accomplishment Recognition Award (2005) For PFOS/PFOA team

INVITED LECTURES/SYMPOSIA

(since employment at EPA)

A.B. Lindstrom and **M. Strynar**, Persistent Perfluorinated Organic Compounds Method Development Research at the U.S. Environmental Protection Agency, Invited Lecture, Center for Marine Environmental Studies Ehime University, Matsuyama, Japan, January 11, 2005.

A.B. Lindstrom and **M. Strynar**, Persistent Perfluorinated Compounds in the Environment: a Brief Introduction to this Important New Class of Pollutants, Invited lecture, National Cancer Center, Research Center for Cancer Prevention and Screening, Epidemiology and Prevention Division, 5-1-1 Tsukiji, Chuo-ku, Tokyo 104-0045, Japan, December 21, 2004

A.B. Lindstrom and **M. Strynar**, Persistent Perfluorinated Compounds in the Environment: a Brief Introduction to this Important New Class of Pollutants, Invited lecture, Yokota Air Base, Tokyo, Japan, December 15, 2004.

A.B. Lindstrom and **M. Strynar**, Persistent Perfluorinated Compounds in the Environment: a Brief Introduction to this Important New Class of Pollutants, Invited lecture, Research Institute for Environmental, Sciences and Public Health of Iwate, Morioka, Japan, December 16, 2004.

A.B. Lindstrom and **M. Strynar**, Persistent Perfluorinated Organic Compounds Method Development Research at the U.S. Environmental Protection Agency, Invited Lecture, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan, December 9, 2004

A.B. Lindstrom and **M. Strynar** Persistent Perfluorinated Compounds in the Environment: a New Challenge for the U.S. Environmental Protection Agency, Tokyo American Center, Embassy of the United States, Tokyo, Japan, December 2, 2004.

A.B. Lindstrom and **M. Strynar**, Overview of Perfluorinated Compound Research at the U.S. Environmental Protection Agency’s NERL/MDAB, Invited Lecture, Kyoto University Graduate School of Medicine, Department of Health and Environmental Sciences, November 17, 2004.

Mark Strynar and Andrew Lindstrom. 2004. Overview of Perfluorinated Compound Research at the U.S. Environmental Protection Agency’s NERL/MDAB. Invited presentation for Johns Hopkins University Division of Environmental Health Engineering Weekly Seminar, March 22nd, 2004.

Mark Strynar and Andrew Lindstrom. 2004. Extraction, Cleanup and Analysis of Fluoro-Telomers in House-Dust By GC/MS. Invited presentation for Perfluoroalkyl Acid Trace Analysis Workshop, USEPA/NHEERL/RTD March 29-30, 2004.

A.B. Lindstrom and **M.J. Strynar**, Biomarker methods development for human exposure assessment research, Biomonitoring Subcommittee, International Life Sciences Institute (ILSI), Health and Environmental Sciences Institute, Washington, DC 20005-5802, October 27, 2003.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Participant in the ILSI HESI Biomonitoring workshop RTP, NC September, 2004.

Participant in the EPA Workshop on the Analysis of Children's Measurement Data September 27-28, 2005 RTP,

NC.

Advisor to the broad scientific community on issues surrounding perfluorinated compounds including academia, state and federal agencies and industry.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Assistance given to other ORD researchers as it relates to methods development, data procurement and analysis and interpretation of data specifically to PFC issues.

Telephone and email correspondence regularly with EPA/OPPT (Libelo, Seed, Fehrenbacher) concerning updates of research and new avenues to explore that meet the data needs of OPPT for perfluorinated compounds.

Delivery of standards and methods to other EPA researchers in Athens (Washington, Weber, Henderson) Duluth (Kuehl) and Cincinnati (Shoemaker), and here in RTP (Lau, Luebke).

PUBLICATIONS

Strynar, M.J., D. Sen, and R.W. Weaver. 1999. Nitrogen and Phosphorus for growth of oil-degrading microorganisms in seawater. *Bioremed. J.* 3 (2):85-91.

Bollag, J.-M., **M. Strynar**, M.-Y. Ahn, and J. Dec. 2002. Characterization of enzymatic or abiotic immobilization of xenobiotics. In. *Soil Mineral-Organic Matter-Microorganism Interactions and Ecosystem Health. Proceedings of the 3rd International Symposium ISMOM 2000. Developments in Soil Science.* Elsevier. p. 289-299.

Strynar, M.J., J. Dec, and J.-M. Bollag. 2002. Anaerobic/Aerobic Composting of Soil Contaminated with 2,4,6-Trinitrotoluene. *Bioremediation J.* 6(1):177-190.

Fujitake, N., **M.J. Strynar**, J. Dec, T. Mishima, M. Tsukamoto, T. Suzuki, H. Otsuka, J.-M. Bollag. 2003. Optimization of a Methylation Procedure to Obtain Chloroform-Soluble Humic Acids. *Soil Science and Nutrition.* 49(3).

Mark Strynar, Jerzy Dec1, Alan Benesi, A. Daniel Jones, and Jean-Marc Bollag. 2004. Using ¹⁹F NMR spectroscopy to determine trifluralin binding to soil. *Envir. Sci. and Technol.* 38: 6645-6655.

C. Lau, J.R. Thibodeaux, R.G. Hanson, M.G. Narotsky, J.M. Rogers, A.B. Lindstrom, and **M.J. Strynar** (2006) Effects of perfluorooctanoic acid exposure during pregnancy in the mouse. *Toxicological Sciences*, 90(2):510-519.

M.J. Strynar and A.B. Lindstrom. (2006) Perfluorinated compounds found in archived house dust. Manuscript in preparation.

BIOGRAPHICAL SKETCH

NAME: Luis Suárez

POSITION TITLE: Pharmacologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Puerto Rico	B.S.	1978	Pharmacy
Purdue University	Ph.D.	1984	Pharmacokinetics

PROFESSIONAL EXPERIENCE

Sept 1985 – Present Pharmacologist – EPA/ORD/NERL/Athens

PUBLICATIONS

Colón, D., Weber, E. J.; Anderson, J. L., Winget, P. and Suárez, L. A. 2006. Reduction of Nitrosobenzenes and *N*-Hydroxylanilines by Fe(II) Species: Elucidation of the Reaction Mechanism, *Environmental Science & Technology*, 40, 4449-4454.

Lassiter, R.R., E.O. Box, R.G. Wiegert, J.M. Johnston, J. Bergengren and L.A. Suárez. 2000. Vulnerability of Ecosystems of the Mid-Atlantic Region, USA, to Climate Change. *Environmental Toxicology and Chemistry*. 19(4):1153-1160.

Suárez, L.A. and R.R. Lassiter. 1999. Coupling the soils model, S, to a global climate model and terrestrial vegetation model to support regional climate scenarios. EPA internal report.

Suárez, L.A., and R.R. Lassiter. 1997. Soils Biogeochemistry. Algorithms and Initial Parameterization of the Simulation Model S. 47p. EPA Internal Report.

Lassiter, R.R., and L.A. Suárez. 1997. Soils Biogeochemistry: Theory and Derivation of the Simulation Model S. 134p. EPA Internal Report.

Suárez, L.A., and M.C. Barber. 1995. Modelling bioaccumulation in aquatic organisms, in *Agrochemical Environmental Fate Studies: State of the Art*, Leng, M.L., Leovey, E.M.K., and Zubkoff, P.L., Eds., Lewis Publishers, Chelsea, MI, Chap. 33.

Burns, L.A., M.C. Barber, S.L. Bird, F.L. Mayer, and L.A. Suárez. 1992. PIRANHA Pesticide and Industrial Chemical Risk Analysis and Hazard Assessment Version 3.0. U.S. Environmental Protection Agency, Athens, GA.

Barber, M.C., L.A. Suárez, and R.R. Lassiter. 1991. Modeling bioaccumulation of organic pollutants in fish with an application to PCBs in Lake Ontario Salmonids. *Canadian Journal of Fisheries and Aquatic Sciences*. 48:318.

Barber, M.C., L.A. Suárez, and R.R. Lassiter. 1988. Modeling bioconcentration of non-polar organic pollutants by fish. *Environmental Toxicology and Chemistry*. 7:545.

Barber, M.C., L.A. Suárez, and R.R. Lassiter. 1988. FGETS (Food and Gill Exchange of Toxic Substances): A Stimulation Model for Predicting Bioaccumulation of Nonpolar Organic Pollutants by Fish. U.S. Environmental Protection Agency, Athens, GA. EPA/600/S3-87/038.

Suárez, L.A., M.C. Barber, and R.R. Lassiter. 1987. GETS, A Simulation Model for Dynamic Bioaccumulation of Nonpolar Organics by Gill Exchange: A User's Guide. U.S. Environmental Protection Agency, Athens, GA. EPA/600/S3-86/057.

BIOGRAPHICAL SKETCH

NAME: Quincy Teng

POSITION TITLE: Research Chemist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Jilin University, China	B.S.	1979	Chemistry
Jilin University, China	M.S.	1982	Physical Chemistry
Florida State University	Ph.D.	1990	Biophysical Chemistry

PROFESSIONAL EXPERIENCE

- 1/06-present Research Chemist, US Environmental Protection Agency, Athens, GA
- 1/94-1/06 Director, Chemical Sciences Magnetic Resonance Facility, Department of Chemistry, University of Georgia, Athens, GA
- 12/99-present Professor of Chemistry, Jilin University, Changchun, China
- 7/92-12/93 Research Associate, Department of Chemistry, University of California, Davis, CA
- 7/91-7/92 NMR Lab Manager/Research Associate, Department of Chemistry, University of Arizona, Tucson, AZ
- 3/90-6/91 Postdoctoral Research Fellow, Cornell University Medical College, New York, NY
- 1/86-3/90 Research/Teaching Assistant, Department of Chemistry, Florida State University, Tallahassee, FL

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Chemical Society
American Association for the Advancement of Science

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Invited Instructor, the National Science Foundation Inorganic Biochemistry Summer Workshops, 1994 – 2000.

PUBLICATIONS

(From total of 45):

1. Quincy Teng, (2005) "Structural Biology: Practical NMR Applications", Springer (New York), 301 pages, hardcover, ISBN: 0-387-24367-4.
2. Porat, I., Sieprawska-Lupa, M., Teng, Q., Bohanon, F.J., White, R.H. and Whitman, W.B. (2006) "Biochemical and genetic characterization of an early step in a novel pathway for the biosynthesis of aromatic amino acids and p-aminobenzoic acid in the archaeon *Methanococcus maripaludis*" *Mol. Microbiol.*, in press.
3. Kim, Y., Teng, Q. and Wicker, L. (2005) "Action pattern of Valencia orange PME de-esterification of high methoxyl pectin and characterization of modified pectins" *Carbohydrate Research*, 340, 2620–2629.
4. Tan, C., de Noronha, R.G., Roecker, A.J., Pyrzynska, B., Teng, Q., *et al.*, (2005) "Identification of a novel small-molecule inhibitor of the hypoxia-inducible factor 1 pathway", *Cancer Research*, 65, 605-612.

5. Porat, I., Waters, B.W., Teng, Q. and Whitman, W.B. (2004) "Two biosynthetic pathways for the aromatic amino acids in the archaeon *Methanococcus maripaludis*", *J. Bacteriol.*, 186, 4940-4950.
6. Osborne, A.S., Teng, Q., Miles, E.W. and Phillips, R.S. (2003) "Detection of Open and Closed Conformations of Tryptophan Synthase by ^{15}N -HSQC NMR of Bound 1- ^{15}N -L-Tryptophan" *Journal of Biological Chemistry*, 278, 44083-44090.

BIOGRAPHICAL SKETCH

NAME: Kent W. Thomas

POSITION TITLE: Research Physical Scientist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
School of Public Health, University of North Carolina –Chapel Hill	B.S.P.H.	1979	Environmental Chemistry
University of North Carolina –Chapel Hill Graduate Coursework		1982 - 87	Analytical Chemistry

PROFESSIONAL EXPERIENCE

September 2005 to September 2006. Physical Scientist, Acting Associate Director for Human Health, Human Exposure and Atmospheric Sciences Division, National Exposure Research Laboratory, Office of Research and Development, United States Environmental Protection Agency, Research Triangle Park, NC 27709.

August 1998 to August 2005. Research Physical Scientist, Exposure Measurements and Analysis Branch, Human Exposure and Atmospheric Sciences Division, National Exposure Research Laboratory, Office of Research and Development, United States Environmental Protection Agency, Research Triangle Park, NC 27709.

January 1980 to August 1998. Analytical Chemist (1980-1986) and Research Analytical Chemist (1986-1998), Analytical and Chemical Sciences, Research Triangle Institute, Research Triangle Park, NC 27709.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Government Councilor (term 2005 – 2008) for the International Society for Exposure Analysis.

SELECTED AWARDS AND HONORS

EPA Silver Medal - Team award for recognition of the contributions to the Chemical Exposure Workgroup of the National Children's Study, 2005

INVITED LECTURES/SYMPOSIA

Agricultural Health Study/Pesticide Exposure Study: Study Design and Preliminary Biomarker Results. International Symposium on Agricultural Exposures and Cancer, Oxford, U.K., Nov. 17 - 22, 2002.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

National Institute of Child Health and Development Special Emphasis Panel ZHD1 DRG-A (C3), Rockville, MD, April 17 - 18, 2005.

Agricultural Worker Pesticide Exposure Research: Comparable Data Conference, Winston-Salem, NC, Sept. 30 - October 1, 2004.

International Biomonitoring Workshop, sponsored by the ILSI Health and Environmental Sciences Institute, rapporteur, Research Triangle Park, September 21 - 22, 2004.

Scientific Advisory Board for The Sister Study, a prospective NIEHS epidemiologic study of environmental and genetic breast cancer risks, 2004 - present.

Expert Panel, HUD National Survey of the Housing Environment, Wash., D.C., Dec. 2, 2003.

National Children's Study Exposure to Chemical Agent Workgroup, 2002 to 2005.

National Human Exposure Assessment Survey Lessons Learned Workshop, Research Triangle Park, NC, August 14, 2001.

EPA representative to the inter-agency Executive Committee for the Agricultural Health Study and the Agricultural Health Study Exposure Workgroup, 1998 to present.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Human Exposure and Atmospheric Sciences Division, Science Council for Human Health Research, 2004 to present.

U.S. EPA Aging Americans: Impacts on Ecology and Environmental Quality Workshop, Research Triangle Park, NC, August 10 - 12, 2004.

U.S. EPA Dietary Exposure Workshop, breakout group leader, Wash., D.C., April 6 - 7, 2004.

NERL representative to the ORD Aging Initiative workgroup, 2003 to present.

U.S. EPA Dietary Exposure Methods Workshop, Crystal City, VA, January 16, 2002.

U.S. EPA Dermal and Non-Dietary Ingestion Exposure Workshop, breakout group leader, Research Triangle Park, NC, September 17, 1998.

PUBLICATIONS

Biomonitoring of Exposure in Farmworker Studies. Dana B. Barr, Kent Thomas, Brian Curwin, Doug Landsittel, James Raymer, Chensheng Lu, K.C. Donnelly, and John Acquavella. *Environ. Health Perspect.* 114(6):936-942, 2006.

Cancer Incidence in the Agricultural Health Study. Michael C. R. Alavanja, Dale P. Sandler, Charles F. Lynch, Charles Knott, Jay H. Lubin, Robert Tarone, Kent Thomas, Mustafa Dosemeci, Joseph Barker, Jane A. Hoppin, and Aaron Blair. *Scand J. Work Environ. Health*, suppl 1:39-45, 2005.

Quantification of 2,4-D on Solid Phase Exposure Sampling Media by LC/MS/MS. M. Gardner, M. Spruill-McCombs, J. Beach, L. Michael, K. Thomas, and R.S. Helburn. *J. Anal. Toxicol.*, 29:188-192, 2005.

Exposure Assessment in the National Children's Study: Introduction. L.L. Needham, R. B. Whyatt, D.B. Barr, R.Y. Wang, G. Akland, L. Naeher, T. Bahadori, A. Bradman, R. Fortmann, L.-J. S. Liu, M. Morandi, M.K. O'Rourke, K. Thomas, J. Quackenboss, P. B. Ryan, V. Zartarian and H. Özkaynak. *Environ. Health Perspect.* 113(8):1076-1082, 2005.

Development and Evaluation of an Enzyme-Linked Immunosorbent Assay (ELISA) Method for the Measurement of 2,4-Dichlorophenoxyacetic Acid in Human Urine. Jane C. Chuang, Jeanette M. Van Emon, Joyce Durnford, and Kent Thomas. *Talanta* 67:658-666, 2005.

Disease and Injury Among Participants in the Agricultural Health Study. A. Blair, D. Sandler, K. Thomas, J.A. Hoppin, F. Kamel, J. Coble, W.J. Lee, J. Rusiecki, C. Knott, C.F. Lynch, J. Lubin, and M. Alavanja. *J. Ag. Safety and Health* 11(2):141-150, 2005.

Mortality Among Participants in the Agricultural Health Study, Aaron Blair, Dale P. Sandler, Robert Tarone, Jay Lubin, Kent Thomas, Jane A. Hoppin, Claudine Samanic, Joseph Coble, Freya Kamel, Charles Knott, Shelia Hoar Zahm, Charles F. Lynch, Nathaniel Rothman, and Michael C. R. Alavanja. *Ann.Epidemiol.* 15:279-285, 2005.

Pesticides and Lung Cancer Risk in the Agricultural Health Study Cohort, Michael C. R. Alavanja, Mustafa

Dosemeci Claudine Samanic, Jay Lubin, Joseph Barker, Charles F. Lynch, Charles Knott, Joseph Barker, Jane A. Hoppin, Dale P. Sandler, Kent Thomas, Joseph Coble, and Aaron Blair. *Am. J. Epidemiol.* 160(9):876-885, 2004

Use of Agricultural Pesticides and Prostate Cancer Risk in the Agricultural Health Study Cohort, Michael C. R. Alavanja, Claudine Samanic, Mustafa Dosemeci, Jay Lubin, Robert Tarone, Charles F. Lynch, Charles Knott, Kent Thomas, Jane A. Hoppin, Joseph Barker, Joseph Coble, Dale P. Sandler, Aaron Blair. *Am. J. Epidemiol.* 157(9):800-814, 2003.

The Challenge of Assessing Children's Residential Exposure to Pesticides, E.A. Cohen Hubal, L.S. Sheldon, M.J. Zufall, J.M. Burke, and K.W. Thomas, *J.Expos. Anal. Environ. Epidemiol.* 10, 638-649, 2000.

Design Strategy for Assessing Multi-Pathway Exposure for Children: the Minnesota Children's Pesticide Exposure Study (MNCPEs), J.J. Quackenboss, E.D. Pellizzari, P. Shubat, R.W. Whitmore, J.L. Adgate, K.W. Thomas, N.C.G. Freeman, C. Stroebe, P.J. Lioy, A.C. Clayton, and K. Sexton. *J. Expos. Anal. Environ. Epidemiol.* 10:145-158, 2000.

Sampling Design, Response Rates, and Analysis Weights for the National Human Exposure Assessment Survey (NHEXAS) in EPA Region 5, R.W. Whitmore, M.Z. Byron, C.A. Clayton, K.W. Thomas, H.S. Zelon, E.D. Pellizzari, P.J. Lioy, and J.J. Quackenboss. *J. Expos. Anal. Environ. Epidemiol.* 9:369-380, 1999.

Population-Based Dietary Intakes and Tap Water Concentrations for Selected Elements in the EPA Region V National Human Exposure Assessment Survey (NHEXAS), K.W. Thomas, E.D. Pellizzari, and M.R. Berry. *J. Expos. Anal. Environ. Epidemiol.* 9:402-413, 1999.

BIOGRAPHICAL SKETCH

NAME: Glen B. Thursby

POSITION TITLE: Research Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of North Carolina, Chapel Hill	B.A	1974	Biology & Art
University of Florida, Gainesville	M.S.	1976	Botany
University of Rhode Island, Kingston	Ph.D.	1983	Biology (Botany)

PROFESSIONAL EXPERIENCE

1995-present Research Biologist, Atlantic Ecology Division, USEPA, Narragansett, RI
1988-1995 Director, Environmental Testing Center, Science Applications International Corporation, Narragansett, RI
1983-1988 Research Assistant Professor, Botany Department, University of Rhode Island, Kingston, RI
1987 Appointed to the graduate faculty, Botany Department, URI
1988-1996 Adjunct Assistant Professor, Botany Department, URI
1996-present Adjunct Associate Professor, Department of Biological Sciences, URI

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Environmental Toxicology and Chemistry, an editor of society's main journal, *Environmental Toxicology and Chemistry*, 2005-present.
Estuarine Research Federation
Phycological Society of America, local host for 2007 annual national meeting.
Northeast Algal Society, treasurer 1997-2002; chair Student Development Committee 2002-present; co-convener for 1997 and 2007 annual meetings.

SELECTED AWARDS AND HONORS

U.S. EPA Science and Technology Achievement Awards:
1984 Steele and Thursby, 1983. A toxicity test using life stages of *Champia parvula* (Rhodophyta). Aquatic Toxicology and Hazard Assessment: Sixth Symposium, ASTM Pub 802. Bishop and Cardwell, Eds., pp. 73-89.
1998 Thursby, Heltshe and Scott. 1997. Revised approach to toxicity test acceptability criteria using a statistical performance assessment. *Environ. Toxicol. Chem.* 16:1322-1329.
2005 Thursby and Abdelrhman. 2004. Growth of the marsh elder *Iva frutescens* in relation to duration of tidal flooding. *Estuaries* 27:217-224.
U.S. EPA Honor Award for Exceptional/Outstanding ORD Technical Assistance to the Regions or Program Offices, 2001
U.S. EPA Bronze Medal for Innovation in Water Quality Criteria for the Protection of Aquatic Life: Saltwater Dissolved Oxygen, 2002

INVITED LECTURES/SYMPOSIA

None in the last 5 years.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Provided technical assistance for the implementation of EPA's saltwater dissolved oxygen criteria in State standards for Alaska, Oregon, Maine, New York, Rhode Island, Georgia, Florida, and Mississippi. Some of this was directly with the particular State, some coordinated through the appropriate EPA regional office, 2000-present. Member of the research advisory committee for the Narragansett Bay National Research Reserve, 1997-1998.

Member of the New Hampshire Sea Grant technical review panel, 2000.
Organizing 2007 annual meeting of the Northeast Algal Society.
On the organizational committee for the 2007 annual national meeting of the Phycological Society of America, a meeting being held with the International Society of Protozoologists in Rhode Island.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Member of the Dissolved Oxygen Work Group for EPA Chesapeake Bay Program, 2000-2004.
Member of Southeast and West Coast Dissolved Oxygen Work Group, 2000-2001.
Core member of the U.S. EPA's Third Aquatic Life Criteria Guidelines Committee sponsored by Office of Water, and member of that committee's sub-committee on media-based criteria, 2003-present.
Invited to Region 4 to present information on how to implement EPA's new saltwater dissolved oxygen criteria for site-specific standards being developed for locations in Georgia and Mississippi. Separate presentations made to staff and management, 2004. Continue to provide technical assistance to Region 4 in the form of review of proposed standards, and the development of spreadsheet-based models to evaluate time-varying dissolved oxygen concentrations.
Technical assistance in the form of review of new water quality criteria for office of water; most recent was diazinon.

PUBLICATIONS

U.S. Environmental Protection Agency. 2000. Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras. EPA Report # 822-R-00-012. (Authored by G.B. Thursby, D. Miller, S. Poucher, L. Coiro, W. Munns and T. Gleason).

Thursby, G.B., E.A. Stern, K.J. Scott, and J. Heltshe. 2000. Survey of toxicity in ambient waters of the Hudson/Raritan Estuary, USA: Importance of small-scale variations. *Environmental Toxicology and Chemistry*. 19:2678-2682.

Nacci, D., J. Serbst, T.R. Gleason, S. Cayula, G. Thursby, W.R. Munns and R.K. Johnson. 2000. Biological response of the sea urchin *Arbacia punctulata* to lead contamination for an estuarine ecological risk assessment. *Journal of Aquatic Ecosystem Stress and Recovery*. 7: 187-199.

Wigand, C., R. Comeleo, R. McKinney, G. Thursby, M. Chintala and M. Charpentier. 2001. Outline of a new approach to evaluate ecological integrity of salt marshes. *Human and Ecological Risk Assessment*. 7:1541-1554.

Thursby, G.B. M.M. Chintala, D. Stetson, C. Wigand and D.M. Champlin. 2002. A rapid, non-destructive method for estimating aboveground biomass of salt marsh grasses. *Wetlands*. 22:626-630.

Wigand, C., R. McKinney, M. Charpentier, M. Chintala and G. Thursby. 2003. Relationships of nitrogen loadings, residential development, and physical characteristics with plant structure in New England salt marshes. *Estuaries*. 26:1494-1504.

Thursby, G.B. and M.A. Abdelrhman. 2004. Growth of the marsh elder *Iva frutescens* in relation to land elevation. *Estuaries*. 27(2): 217-224.

Wigand, C., G.B. Thursby, R.A. McKinney and A.F. Santos. 2004. Response of *Spartina patens* to dissolved inorganic nutrient additions in the field. *Journal of Coastal Research*. 45:134-149.

Boese, B.L., B.D. Robbins, G.B. Thursby. 2005. Dessiccation is a limiting factor for eelgrass (*Zostera marina* L.) distribution in the intertidal zone of a northeastern Pacific (USA) estuary. *Botanica Marina* 48:274-283.

Chintala, M.M., C. Wigand, G. Thursby. 2006. Comparison of *Geukensia demissa* populations in Rhode Island fringe salt marshes with varying nitrogen loads. *Mar. Ecol. Prog. Ser.* 320:101-108.

NARRATIVE

I have over 25 years of experience with aquatic toxicity testing for both plants and animals. This includes developing and conducting these types of tests, as well as interpreting and incorporating data into saltwater sections of EPA's water quality criteria. My current work is based on this experience, and is focused on how to incorporate data from traditional endpoints in laboratory tests into population models. How do we take data from relatively short-term tests using constant exposures, with endpoints based on responses at the individual level (e.g., survival, reproduction), and apply them to populations experiencing long-term exposure to time-varying concentrations.

BIOGRAPHICAL SKETCH

NAME: Daniel A. Vallero

POSITION TITLE: Environmental Scientist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Southern Illinois University	B.S.	1974	Earth Sciences
Southern Illinois University	M.S.	1977	City & Regional Planning
University of Kansas	M.S.	1996	Environmental Health Sciences
Duke University	Ph.D.	2000	Civil & Environmental Engineering

PROFESSIONAL EXPERIENCE (From 1995 to Present)

Research Environmental Scientist - 01/2004 to Present, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711

Acting Branch Chief - 08/2000 to 04/2002, Human Exposure Analysis Branch, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711

Research Team Leader - 01/1994 through 11/2000, Air Toxics and Endocrine Disruptor Exposure Research, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711

Research Environmental Scientist - 08/1996 through 12/1999, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711

Branch Chief - 05/1998 through 09/1998, Exposure Methods and Monitoring Branch, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711

Branch Chief - 09/1995 through 03/1997, Source Apportionment and Characterization Branch, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711

Branch Chief - 06/1995 through 09/1995, Exposure Assessment Branch, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711

Acting Division Director - 02/1995 through 06/1995, Air Exposure Research Division, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711

Deputy Director - 07/1993 through 02/1995, Human Exposure and Field Research Division, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711

ACADEMIC EXPERIENCE (From 1999 to Present)

2005 – Present **Adjunct Professor**, Pratt School of Engineering, Duke University, Durham, NC 27708-0827

2002 – 2004 **Adjunct Associate Professor of Civil and Environmental Engineering**, Department of Civil and Environmental Engineering, Pratt School of Engineering, Duke University, Durham, NC 27708-0827

2002 – 2004 **Associate Professor**, Biology Department, North Carolina Central University, Room 105 Taylor Building, 1801 Fayetteville Street, Durham, NC 27707

1997 – 2004 **Director**, Program in Science, Technology and Human Values, Duke University, Durham, NC 27708-0827

1999 - 2002 **Adjunct Assistant Professor of Civil and Environmental Engineering**, Department of Civil and Environmental Engineering, Duke University, Durham, NC 27708-0827

1998 - 1999 **Engineering Lecturer**, Hazardous Waste Engineering, Civil and Environmental Engineering, Duke University, Durham, NC 27708-0827

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Member, American Society of Civil Engineers

Member, International Society of Exposure Analysis

Member, Association of Environmental Engineering and Science Professors

Faculty Advisor, Engineers Without Borders, Duke Chapter

Member, Executive Committee, Sigma Xi, the Scientific Research Society, UNC Chapter

Consulting Editor, McGraw-Hill Encyclopedia of Science and Technology (Environmental Engineering)
Member, Sigma Xi, the Scientific Research Society (Elected to Full Membership in 1985)

SELECTED AWARDS AND HONORS

Special Faculty Commendation, North Carolina Central University, 2003
National Commendation, Excellence in Response, World Trade Center, U.S. EPA, 2002
Superior Accomplishment Award, 2001
Award for Exceptional/Outstanding ORD Technical Assistance to the Regions or Program Offices, 2001
Jeffrey Taub Award, Duke University, Department of Civil and Environmental Engineering, 1999
Bronze Medals for Commendable Service, U.S. EPA, 1990, 1998 and 2005

INVITED LECTURES/SYMPOSIA

Vallero D. and Laursen, T. "Panacea or Pandora's Box: New Opportunities and New Risks at the Nanoscale,"
Nanotechnology, Biotechnology and Society Symposium, Center for Integrated Education Research and
Development, Duke University, Durham, NC, March 31, 2006.

Vallero, D. "Sustainability from Nano to Global Scales," Panel on Emerging Technologies and the Environment,
Research Triangle Universities Symposium on Environmental Conflict Resolution, National Resources
Leadership Institute, Raleigh, NC, February 10, 2006.

Lioy, P. **Vallero, D.**, Foley, G., Blancato, J., DaLoia, J., Georgopoulos, P. Heiser, J., Kalb, P. and Reynolds, M. "The
Urban Dispersion Program (UDP) NYC MSG05 Experiment," International Society of Exposure Analysis,
Annual Conference, Tucson, AZ, November 2, 2005.

Vallero, D., Conner, T. and Highsmith, R. "Exposure Research Supporting the EPA Asbestos Action Plan," Asbestos
Site Evaluation and Cleanup Workshop, Safety Harbor, FL, December 8, 2004.

Vallero, D. "Just Engineering: Peace; Justice; and Sustainability," Engineers for Peace Conference, Bucknell
University, Lewisburg, PA, Invited lecture: November 14, 2003.

Swartz, E., Stockburger, L. and **Vallero, D.** "Polycyclic Aromatic Hydrocarbons (PAHs) and Other Semi-volatile
Organic Compounds Collected in New York City in Response to the Events of 9/11," 226th American
Chemical Society, National Meeting, New York, NY, September 7-11, 2003.

Seila, R., Swartz, E., Lonneman, W., and **Vallero, D.** "Volatile Organic Compounds Measurements in New York
City
in Response to the Events of 9/11," 226th American Chemical Society, National Meeting, New York, NY,
September 7-11, 2003.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Member, EPA Risk Assessment Forum, 1992-Present (Reappointed in 1995 and 1998)
Journal Referee: *Environmental Science & Technology*, *Journal of Air and Waste Management*, *Environmental
Engineering Science*, *Journal of Environmental Engineering*, *Journal of Environmental Quality*, *Journal of
Agricultural and Food Chemistry*, *Atmospheric Environment*, and *The World Resource Review*, 1993.
Book Reviewer, *E-Streams* and McGraw-Hill
Faculty Advisor, Duke University, Information Sciences + Studies Program

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Lead, World Trade Center ORD Air Monitoring Team
Lead Investigator on Methylcyclopentadienyl Manganese Tricarbonyl (MMT) Fuel Additive Exposure Team
Tracer Gas Measurement and Modeling, Asbestos Exposure Assessment, Homeland Security, and Computational
Toxicology; Principal Investigator on University Partnership Agreement, Contract Officer Representative on
Perfluoride Tracer Analysis Work Assignment, and Contract Officer Representative on Asbestos Exposure
Characterization Task Order.
Principal Investigator, University Partnership Agreement
Project Officer, EPA/FHWA, Near Roadway Interagency Agreement

PUBLICATIONS

(Represent 18 out over 100 for the period 1997-2006)

- Vallero, D.A. and Vesilind, P.A., *Socially Responsible Engineering*. John Wiley and Sons, Inc., Hoboken, NJ, ISBN: 0471787078, 384, 2006.
- Vallero, D. Chapter 4, "Just Engineering: Peace; Justice; and Sustainability," in *Peace Engineering: When Personal Values and Engineering Careers Converge*. Edited by P. A. Vesilind. Lakeshore Press, Woodsville, NH, ISBN: 0965053954, 143 pages, 2005.
- Vallero, D.A., *Paradigms Lost: Learning from Environmental Mistakes, Mishaps and Misdeeds*. Elsevier Butterworth-Heinemann, Amsterdam, Netherlands and Boston MA, ISBN: 0750678887, 688 pages, 2005.
- Vallero, D.A., *Environmental Contaminants: Assessment and Control*. Academic Press, New York, NY, ISBN: 0127100571, 832 pages, 2004.
- Vallero, D.A., *Engineering the Risks of Hazardous Wastes*. Butterworth-Heinemann, Amsterdam, Netherlands and Boston MA, ISBN: 0750677422, 306 pages, 2003. (Contribution by J.J. Peirce).
- Vallero, D. and Vesilind, P., Preventing disputes with fairness and empathy, *Journal of Professional Issues in Engineering Education and Practice*, in press, accepted February 23, 2006.
- Blancato, J. and Vallero, D. *Environmental Computational Toxicology*. Yearbook of Science and Technology, McGraw-Hill Professional, New York, NY, 2006.
- Vallero, D. Factors in the Geotropospheric Flux of Semivolatile Organic Compounds. *Environmental Engineering Science*. 22 (1), 109-125, 2005.
- Vallero, D. Persistent, Bioaccumulating and Toxic Substances. Yearbook of Science and Technology, McGraw-Hill Professional, New York, NY, 2005.
- Vette, R. Seila, E. Swartz, J. Pleil, L. Webb, M. Landis, A. Huber, and D. Vallero, Air pollution measurements in the vicinity of the World Trade Center, *Environmental Management: Air and Waste Management Association*. February issue, 23-26, 2004.
- Swartz, E., Stockburger, L. and Vallero, D. Polyaromatic hydrocarbons and other semi-volatile organic compounds collected in New York City in response to the events of 9/11. *Environmental Science and Technology*. 37 (16), 3537-46, 2003.
- Vallero, D. Teachable moments and the tyranny of the syllabus: The September eleventh case. *Journal of Professional Issues in Engineering Education*. 129 (2), 100-105, 2003.
- Vallero, D., Banks, Y., and Leovic, K., Innovative Approaches to Human Exposure Assessment in Environmental Justice Communities, *Proceedings of the 2002 National Conference on Environmental Science and Technology*, Greensboro, NC, September 8-10, 2002, G. Uzochukwu, K. Schimmel, G. Reddy, S-Y. Chang and V. Kabadi, (Editors), article refereed and peer reviewed, Battelle Press, Columbus, OH, 371-386, 2003.
- Vallero, D. *Environmental Endocrine Disruptors*. Yearbook of Science and Technology, McGraw-Hill Professional, New York, NY, 2004.
- Lioy, P., Weisel, C., Millette, J. Eisenreich, S., Vallero, D., Offenberg, J., Buckley, B., Turpin, B., Zhong, M., Cohen, M., Prophete, C., Yang, I., Stiles, R., Chee, G., Johnson, W., Alimokhtari, S. Weschler, C., and Chen, L. Characterization of the dust/smoke aerosol that settled east of the World Trade Center (WTC) in Lower Manhattan after the collapse of the 11 September 11 2001. *Environmental Health Perspectives*. 110 (7), 703-714, 2002.
- Vallero, D. and Peirce, J. Transformation and transport of vinclozolin from soil to air. *Journal of Environmental Engineering*, 128 (3), 261-268, 2002.
- Vallero, D., Banks, Y., and Leovic, K., Innovative approaches to human exposure assessment in environmental justice communities," *Proceedings of the National Conference on Environmental Science and Technology*, Greensboro, NC, September 2002. (Peer reviewed and in press).
- Vallero, D.A. and Peirce, J.J. Hydrologic conditions affecting tropospheric flux of vinclozolin and its degradation products. *Hydrological Science and Technology*, 17 (1-4): 371-385, 2001.
- Vallero, D., Farnsworth, J., and Peirce, J. Degradation and migration of vinclozolin in sand and soil. *Journal of Environmental Engineering*, 127 (10): 952-957, 2001.
- Doctoral Dissertation: Vallero, D.A. Dicarboximide Fungicide Flux to the Lower Troposphere from an Aquic Hapludult Soil, Duke University, 2000.

NARRATIVE

Dr. Vallero's is recognized as a leader in environmental research, engineering education, ethics, and environmental justice.

BIOGRAPHICAL SKETCH

NAME: Jerry L. Varns

POSITION TITLE: Scientist IV, Grantee

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
William Jewell College	B.A.	1964	Chemistry (Minor: Biology/Economics)
Purdue University	Ph.D.	1970	Biochemistry (Minor: Organic Chemistry / Plant Physiology)

PROFESSIONAL EXPERIENCE

1970 - Joined U.S. Agricultural Research Service; developed a recognized expertise in measuring the quality of stored perishable crops by computerized air monitoring of volatile metabolites.

1989 - Transferred to U. S. EPA after completing a Federal Research Fellowship for needed techniques to measure trace polar organic volatile compounds in air; following auto-GC evaluations for EPA's Atlanta Air Toxics Study in 1990, he served in the following research and managerial positions:

1990-92 – Section Chief, Ambient Methods Research Branch, AMRD, AREAL

1992-94 – Deputy Division Director, AMRD, AREAL (1992-94); also Acting Branch Chief, AMRD (1994)

1993-94 – Methods Chair, North American Strategy for Tropospheric Ozone, (draft document responsibility)

1995 - Sabbatical: statistics and research using CZE for separation of photo-oxidation products of biogenic compounds

1996 – Co-principal Investigator, Internal Research Grant: passive monitoring of ozone

1996 - Acting Branch Chief (MB/AMRD)

1996 – Principal Investigator, two Internal Grants: passive monitoring of ozone; trace endocrine disrupting pollutants, including pesticides.

1999 – Retired from Federal Service (31 years)

2000-2003 – formed V/M Passive Technology, a private consultative partnership specializing in the development of networks using passive monitoring devices for air quality measurements. EPA Region 6 was a client that requested tropospheric ozone measurements in Dallas/Fort Worth.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Potato Journal, former Associate Editor (4 years)

Member, Air & Waste Management Association (OWMA)

Member, Society of Environmental Toxicology and Chemistry (SETAC)

SELECTED AWARDS AND HONORS

USDA/ARS -

Isolated and named the plant phytoalexin, Phytuberin; ARS research leader position - stored commodities expertise; developed VALID Monitoring System to detect disease using volatile organic metabolites; knowledge of biochemistry of stress/disease; Editor for American Potato Journal.

\$ 1988 - Recipient, ARS Competitive Fellowship Program (one year Sabbatical to USEPA)

1987 - USDA/ARS Recognition for ADP Implementation

1985-87 - Awarded Competitive Grants from Regional Growers' Association

1981 - Awarded USDA Competitive Grant, Pilot Testing of VALID system (\$180K)

USEPA -

EPA researcher - portable GC analyses in USSR (2 yrs); evaluated auto-GCs for a major intensive study

1990 - Special Act Award for US/USSR "AutoEX" Studies

1991 - Recipient, EPA/ORD Competitive Innovative Research Funding
1991 – Acting Section Chief, Methods Development
1991 - Recipient, Executive Potential Program (one year)
1992-95 – Deputy Director, Method R&D (MRDD) with additional duties of Acting Chief, AMRB/MRDD; Methods Coordinator for NARSTO; AREAL representative, Consortium for Advanced Biosensors (CAB/NIST)
1992 - Received two On-the-Spot Awards as Total Quality Management Facilitator
1993 - Special Act Award: Budget Conversion to Competitive Assistance Agreements
1994 - Recipient, EPA/OMMSQA Sabbatical/Long Term Training Program (nine months)
1995 - Special Achievement Award: Methods Chair during formation of North American Strategy for Tropospheric Ozone (NARSTO)
1996 - Internal Grant Award for FY 97-98; special act recognition for Acting Chief, Methods Branch
1998 - Recipient, "Wildlife Biologist of the Year" by the North Carolina Bowhunters Association for scientific and public activities on the white-tailed deer (USEPA project).
2003 – Recipient, Scientific and Technological Achievement Award, Level II, by Science Advisory Board/USEPA for “Using Community Involvement to Conduct a High Quality Passive Monitoring Program” (2 publications).

INVITED LECTURES/SYMPOSIA

Varns, J. L. and L. T. Cupitt, 1992. Implications of the 1990 Clean Air Act Amendment on Air Toxics Monitoring and Methods, Spring Conference of Ontario Section of Air & Waste Management Assoc., Toronto, Ontario, Canada, April 26 - 29 (Invited Presentation).

Varns, J. L. and J. D. Mulik, 1997. Testing of an Ozone Passive Sampling Device (PSD) in Urban Environments, Proceedings, EPA/AWMA International Symposium on Measurement of Toxic and Related Air Pollutants, Research Triangle Park, NC.

Varns, J. L., A. E. Bond, J. E. Bumgarner, S. Harper, M. Medina-Vera, M. C. Wilkins; B. F. Daniel, Charlie Smith and D. T. Heggem. 1998. EPA Near-Laboratory Ecological Research Areas (NLERA) to Accelerate the Vulnerability Assessment of Large Geographical Regions, EPA/SETAC Ecological Vulnerability Symposium and Workshop, Poster Session, Seattle, WA.

Jerry L. Varns and James D. Mulik,; Mark E. Sather; Melody K. Lister; Graham Glenn, Luther Smith and Dennis D. Williams; Elizabeth A. Betz and Avis P. Hines. 1999. The Passive Ozone Network in Dallas (POND Concept) - a Modeling Opportunity with Community Involvement., Dual Poster Presentation, 31st Annual Air Pollution Conference, Corvallis, OR, April 26-29.

Jerry L. Varns and James D. Mulik *et al.*, 1999. Above POND posters & network training video requested and featured at First International Urban Environmental Infrastructure Forum, Annual AWMA Meeting, St. Louis, MO, June 20-24 (Letter of Invitation).

Varns, J. L. and J. D. Mulik, 2001. Factors and Costs for Daily Regional Ozone Sampling by a Publically-operated Passive Network, Proceedings, Passive Sampling of Gaseous Air Pollutants in Ecological Effects Research, 33rd Air Pollution Workshop, Riverside, CA, April 9-12 (Invited as Workshop Moderators).

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

See Achievements and Awards during career with the USEPA

PUBLICATIONS

(Selected)

Varns, J. L., L. A. Schaper and M. T. Glynn, 1986. Carbon Dioxide and Wind Monitoring in a Commercial Potato Storage, In: Engineering for Potatoes (B. F. Cargill, Ed.), jointly published by ASAE & Michigan State University, pp. 598-615.

Varns, J. L., 1986. Volatile Monitoring for Disease Detection in Potato Storages: Defining the Sampling Regime and Ventilation Strategy for Commercial Application, (Principal Investigator, USDA Pilot Test Project NCR-82-1, CRIS 21010-001-02D, OCG formal project review; approved with FY 1987 funded extension, 32 pages).

Schaper, L. A. and **J. L. Varns**, 1987. Computerized Gas Sampling and Analysis System for Potato Storages, Trans. ASAE 30:1807-1810.

USEPA -

Varns, J. L., J. D. Mulik and D. Williams, 1990. Passive Sampling Devices and Canisters: Their Comparison in Measuring Air Toxics During a Field Study, Proceedings, EPA/AWMA International Symposium on Measurement of Toxic and Related Air Pollutants, Raleigh, NC, EPA/600/9-90/026; pp. 219-226.

Varns, J. L. and R. E. Berkley, 1990. Continuous Measurement of Volatile Organic Compounds by Gas Chromatography, Proceedings, Soviet-American Symposium on Mobile Source Air Pollution (Auto-Ex), Novgorod, Russia (USSR), October 20-25, Vol.1, Main Geophysical Observatory, St. Petersburg, Russia, 1992, pp. 42-53.

Berkley, R. E. and **J. L. Varns**, 1990. Functional Principles and Operational Features of Portable Gas Chromatographs, Proceedings, Soviet-American Symposium on Mobile Source Air Pollution (Auto-Ex), Novgorod, Russia (USSR), October 20-25, Vol.1, Main Geophysical Observatory, St. Petersburg, Russia, 1992, pp. 85-101

Berkley, R. E., **J. L. Varns** and J. D. Pleil, 1991. Comparison of Portable Gas Chromatographs with Passivated Canisters for Field Sampling Airborne Toxic Organic Vapors in USA and USSR, Environ. Sci. Technol. 25: 1439-1444.

Mulik, J. D. and **J. L. Varns et al.** 1991. Using Passive Sampling Devices to Measure Selected Air Volatiles for Assessing Ecological Change, Proceedings, EPA/AWMA International Symposium on Measurement of Toxic and Related Air Pollutants, Raleigh, NC, Vol I, pp 285-290.

Varns, J. L. 1997. Editor, EPA Report: Description of Neuse River Basin and Stakeholder Activities – A Description of one of four National Exposure Research Laboratory (NERL) Near-Lab Sites for Validation of Innovative Methodologies to Assess Regional Vulnerability; requirement through the Neuse Ecological Research Team (NERT) at NERL/RTP), 55 pp.

Varns, J. L., J. D. Mulik and E. A. Betz. 1998. EPA/600-V-98/001 (Video: Site Training for the POND (Passive Ozone Network in Dallas), a peer-reviewed video for generic instruction of lay operations in a passive ozone monitoring network; distributed to 30-site network in and surrounding Dallas, TX, 12 min.

Varns, J. L. and J. D. Mulik. 1998. A Preliminary Report on 1997 Data Collected with Ozone-Passive Sampling Devices (O₃-PSDs) Collocated with PAMS in Dallas; Examples of POND Documentation Used in Preparation for Summer '98 Ozone Monitoring, Interim Report, requested by Regions 4 & 6), 17 pp.

Varns, J. L., *et al.* 2001. Passive Ozone Network of Dallas: A Modeling Opportunity with Community Involvement 1, Environ. Sci. Technol. 35, 845-855.

Sather, M. E., **J. L. Varns**, J. D. Mulik, *et al.* 2001. Passive Ozone Network of Dallas: A Modeling Opportunity with Community Involvement. 2, Environ. Sci. Technol. 35, 4426-4435.

BIOGRAPHICAL SKETCH

NAME: Calvin C. Walker

POSITION TITLE: Research Chemist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Mississippi State University	B.S.	1973	Animal Science
Auburn University	D.V.M.	1978	Veterinary Medicine
Louisiana State University	Ph.D.	1993	Pharmacology & Toxicology

PROFESSIONAL EXPERIENCE

1997-present Research Chemist, GED/NHEERL, US EPA, Gulf Breeze, FL
1995-1997 Supervisory Chemist, Veterinary Drug and General Chemistry Section, Denver District Laboratory, US Food and Drug Administration, Denver, CO
1994-1995 Research Chemist, Animal Drugs Research Center, US Food and Drug Administration, Denver, CO
1993-1994 Postdoctoral Research Scientist, Laboratory for Residue Studies, School of Veterinary Medicine, Louisiana State University, Baton Rouge, LA
1989-1993 Ethyl Corporation Graduate Fellow in Toxicology, School of Veterinary Medicine, Louisiana State University, Baton Rouge, LA
1978-1989 Veterinary Clinician. Town and Country Veterinary Clinic, Gulfport, MS, Tidewater Animal Clinic, Ocean Springs, MS, Ocean Springs Animal Hospital, P.A., Ocean Springs, MS, Town & Country Veterinary Hospital, Gautier, MS

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

American Academy of Veterinary and Comparative Toxicology - Fellow
American Academy of Veterinary Pharmacology and Therapeutics - Fellow
International Association for Aquatic Animal Medicine

SELECTED AWARDS AND HONORS

Director's Special Citation Award from US FDA, Center for Food Safety and Nutrition for service as subject matter expert for the Seafood Research Program. 2005.

INVITED LECTURES/SYMPOSIA

"Protein Expression Profiling for Classifying Chemicals by Mode of Action", OPPTS/ORD Seminar Series, Washington, DC, June 21, 2006.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

"Assessing Environmental Health and Ecosystem Function using Molecular Tools" Workshop at Oak Ridge Center for Advanced Studies (ORCAS), Oak Ridge, TN, July 20-21, 2005.

NOAA Coastal Ocean Program Peer Review Panel. Panel reviewer and analyst of Aquatic Research Consortium. 2005.

EPA-NCER Peer Review Panel. Panel reviewer for NCER STAR grants. 2002.

Consulting Veterinarian and subject matter expert for USFDA, Gulf Coast Seafood Laboratory, Dauphin Island, AL, 2001-present

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Committee Member for NHEERL Safe Pesticides/Safe Products MYP Implementation Plan.
2003-present

PUBLICATIONS

- Walker, C., Salinas, K., Harris, P, Wilkinson, S., Watts, J and Hemmer, M. (2006) A proteomic (SELDI-TOF-MS) approach to estrogen agonist screening. *Toxicological Sciences*, accepted and in press 2006.
- Dickey RW, SM Plakas, ELE Jester, KR El Said, JN Johannessen, LJ Flewelling, P Scott, DG Hammond, FM Van Dolah, TA Leighfield, M-Y Bottein Dachraoui, JS Ramsdell, RH Pierce, MS Henry, MA Poli, CC Walker, J Kurtz, J Naar, DG Baden, SM Musser, KD White, P Truman, A Miller, TP Hawryluk, MM Wekell, D Stirling, MA Quilliam, and JK Lee (2003) Multi-laboratory Study of Five Methods for the Determination of Brevetoxins in Shellfish Tissue Extracts. *Harmful Algae*. Proceedings of the Xth International Conference on Harmful Algae. Steidinger, K.A., Landsberg, J.H., Tomas, C.R., and Vargo, G.A. (Eds).
- Lewis, MA, Dantin, DD, Walker, CC, Kurtz, JC and Greene, RA (2003) Toxicity of clay flocculation of the toxic dinoflagellate, *Karenia brevis*, to estuarine invertebrates and fish. *Harmful Algae* 2:235-246.
- Vogelbein WK, Lovko VJ, Shields JD, Reese KS, Mason PL, Haas LW & Walker CC (2002) *Pfiesteria shumwayae* kills fish by micropredation not exotoxin secretion. *Nature*. 418:967-970.
- Roybal JE, Walker CC, Pfenning AP, Turnipseed SB, Storey JM, Gonzales SA and Hurlbut JA. (2002) Concurrent Determination of Four Fluoroquinolones: Ciprofloxacin, Enrofloxacin, Sarafloxacin and Difloxacin in Catfish, Shrimp and Salmon by LC with Fluorescence Detection. *J. AOAC International*. 85(6):1293-1301.
- Plakas, SM, El Said, KR, Bencsath, FA, Musser, SM and Walker, C.C. (1999) Determination of Flumequine in Channel Catfish by Liquid Chromatography with Fluorescence Detection. *J. AOAC International* 82(3):614-619.
- Turnipseed SB, Walker CC, Roybal JE, Pfenning AP, Hurlbut JA (1998) Confirmation of fluoroquinolones in catfish muscle by electrospray liquid chromatography/mass spectrometry. *J. AOAC International* 81(3):554-562.
- Ang CY, Luo W, Kiessling CR, McKim K, Lochmann R, Walker CC, Thompson HC Jr (1998) A bridging study between liquid chromatography and microbial inhibition assay methods for determining amoxicillin residues in catfish muscle. *J. AOAC International* 81(1):33-39.
- Rupp, H.S., Turnipseed, Walker, C.C., Roybal, J.E., and Long, A.R. (1998) Determination of ivermectin in salmon muscle tissue by liquid chromatography with fluorescence detection. *J. AOAC International* 81(3):549-553.

BIOGRAPHICAL SKETCH

NAME: Ronald S. Waschmann

POSITION TITLE: Biologist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Idaho State University, Pocatello	B.S.	1987	Plant Ecology
Idaho State University, Pocatello	B.A.	1987	Anthropology
University of Florida, Gainesville	M.A.	1990	Anthropology

PROFESSIONAL EXPERIENCE

1998- Present: Biologist, U.S. Environmental Protection Agency, Corvallis OR

1996-1998: Senior Scientist, Dynamac Corp., Global Climate Change, Processes and Effects Program, Corvallis OR

1995-1996: Senior Scientist, ManTech Environmental Research Services Corp., Global Climate Change, Processes and Effects Program, Corvallis OR

1992-1995: Plant Ecologist, ManTech Environmental Technology, Inc., Global Climate Change, Processes and Effects

Program, Corvallis, OR

1991: Senior Biological Scientist, Agronomy Physiology Department, University of Florida, Gainesville

1989: Research Assistant, Institute of Food and Agricultural Sciences, Department of Agronomy, University of Florida, Gainesville

1987-1988: Senior Research Assistant, Dept. of Biology, Idaho State University, Pocatello

1984-1987: Research Assistant, Dept. of Biology, Idaho State University, Pocatello

1985: Anthropological Research Assistant, U.S. Agency for International Development, Central Selva Natural Resource Management Project, Palcazú, Peru

PUBLICATIONS

David T. Tingey, Mark G. Johnson, E. Henry Lee, Claudia Wise, Ronald Waschmann, David M. Olszyk, Lidia S. Watrud and Kelly K. Donegan. 2006. Effects of elevated CO₂ and O₃ on soil respiration under ponderosa pine. *Soil Biology and Biochemistry*.

D.T. Tingey, E.H. Lee, R. Waschmann, M.G. Johnson, and P.T. Rygielwicz. 2006. Does soil CO₂ efflux acclimatize to elevated temperature and CO₂ during long-term treatment of Douglas-fir seedlings? *New Phytologist* 170: 107-118

David T. Tingey, Ronald S. Waschmann, Donald L. Phillips, David M. Olszyk. 2000. The Carbon Dioxide Leakage From Chambers Measured Using Sulfur Hexafluoride. *Environmental and Experimental Botany*, 43: 101-110.

Tingey, David T., Bruce D. McVeety, Ron Waschmann, Mark G. Johnson, Donald L. Phillips, Paul Rygielwicz, and David M. Olszyk. 1996. A Versatile Sun-lit Controlled-Environment Facility for Studying Plant and Soil Processes. *Journal of Environmental Quality*, 25: 614-625.

Baker, J.T., L.H. Allen, Jr., K.J. Boote, J.W. Jones, P.H. Jones, A.J. Rowland-Bamford, G. Bowes, D.A. Graetz, K.R. Reddy, R.S. Waschmann, S.L. Albrecht, K.T. Shanmugam, and F. Kamuru. 1992. Response of Vegetation to Carbon Dioxide - 062. Carbon Dioxide Effects on Growth, Photosynthesis, and Evapotranspiration of Rice at Three Nitrogen Fertilizer Levels. 1990 Progress Report. Joint Program of DOE and USDA, University of Florida, Gainesville.

Baker, J.T., L.H. Allen, Jr., K.J. Boote, A.J. Rowland-Bamford, R.S. Waschmann, J.W. Jones, P.H. Jones, and G. Bowes. 1991. Response of Vegetation to Carbon Dioxide - 060. Temperature Effects on Rice at Elevated CO₂

Concentration. 1989 Progress Report. Joint Program of DOE and USDA, University of Florida, Gainesville.

Waschmann, R.S. and J.E. Anderson. 1988. Evapotranspiration as Related to Waste Management Areas. Annual Progress Report for Idaho National Engineering Laboratory Radioecology and Ecology Programs.

Waschmann, R.S. 1985. A Pilot Study on the Competition Between Amuesha Cattle, Forest, and Agricultural Land-Uses. Report Prepared for U.S. Agency for International Development, Central Selva Resource Management Project, Palcazú, Perú.

BIOGRAPHICAL SKETCH

NAME: John W. Washington

POSITION TITLE: Research Chemist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Penn State University.	B.S.	1982.	Environmental Resource Manag.
Penn State University.	M.S.	1985.	Environmental Pollution Control.
Penn State University.	Ph.D.	1991.	Geochemistry and Mineralogy.

PROFESSIONAL EXPERIENCE

- Oct. 2002-present.** Research Chemist, National Exposure Research Laboratory, USEPA, Athens, GA.
Sept. 1998-Oct. 2002. Chemist, National Exposure Research Laboratory, USEPA. Athens, GA.
Dec. 1997-Aug. 1998. Vice President, Meiser & Earl, Inc., State College, PA. a geological and environmental consulting.
Dec. 1997-Aug. 1998. Secretary, Board of Directors, Meiser & Earl, Inc., State College, PA.
Dec. 1993-Aug. 1998. Member, Board of Directors, Meiser & Earl, Inc., State College, PA.
Jan. 1992-Aug. 1998. Senior Geochemist, Meiser & Earl, Inc., State College, PA.
Jun. 1990-Dec. 1991. Project Hydrogeologist, Meiser & Earl, Inc., State College, PA.
May 1985-Jun. 1990. Part-time Geochemist/Hydrogeologist, Meiser & Earl, Inc., State College, PA.
Sept. 1985-Jun. 1990. Graduate Assistant, Department of Geosciences, Penn State University, University Park, PA.
Dec. 1982-Jun. 1985. Graduate Assistant, Department of Agronomy, Penn State University, University Park, PA.

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

- American Geophysical Union.** Member.
Sigma Xi. The Scientific Research Society. Member.
Gamma Sigma Delta. The Honor Society of Agriculture. Member.
The Geochemical Society. Member.

SELECTED AWARDS AND HONORS

- 2006 USEPA OPPT Bronze Medal.** Awarded by the Office of Pollution Prevention and Toxics to members of the Perfluorooctyl Sulfonate (PFOS) and the Perfluorooctanoic Acid (PFOA) Team “for exemplary efforts to reduce serious hazards and potential risks associated with PFOS and PFOA chemicals. (includes Risk Assessment, LOI’s, ECA’s, MOU’s, SNUR’s, Overall coordination, SEPs, and New Chemical Submissions).”
- 2005 USEPA Scientific and Technological Achievement Award – Level II in Transport and Fate for Washington, J.W., Endale, D.M., Samarkina, L.P., and Chappell, K.E.** 2004. Kinetic control of oxidation state at thermodynamically buffered potentials in subsurface waters. *Geochimica et Cosmochimica Acta*. 68 (23): 4831-4832.
- USEPA Science Achievement Award in Earth Science.** As one of the USEPA Honor Awards, this “represents the highest form of employee recognition.” Citation: *For combining challenging field and laboratory efforts with quantitative chemical modeling to advance our fundamental understanding of redox chemistry in environmental systems.* May, 2005.
- 2003 USEPA Scientific and Technological Achievement Award, Honorable Mention for Washington, J.W., B.A. Cameron.** 2001. Elucidating a Cause for the Gap in Field vs. Lab k_{deg} for Organic Contaminants Using Analytic Models. *Environmental Toxicology and Chemistry*.

INVITED LECTURES/SYMPOSIA

- Gordon Research Conference: Environmental Sciences.** Control of Single-Couple Oxidation State by Simultaneous Reduction and Oxidation in Non-Equilibrium Complex Systems. Plymouth, NH. June, 2006.
- EPA Science Forum Poster Presentation.** (Thomas, R., Washington, J., and Samarkina, L.), 2006, Aerobic Denitrification: Implications for Nitrogen Fate Modeling in the Missouri-Ohio-Mississippi (MOM) River Basin, Washington, DC. Spring, 2006.
- SETAC National Meeting.** Design of Biodegradation Experiments for Fluorotelomer-Based Polymers. Baltimore, MD. November, 2005.
- SETAC National Meeting.** Determination of Perfluorinated Chemicals (PFCs) in Soils, Sediment and Other Matrices. Baltimore, MD. November, 2005.
- Georgia Legislature, Committee Hearing.** Invited public testimony as an expert on landfill chemistry regarding siting landfills in Georgia was reported in the February 23, 2004 Atlanta Journal Constitution. Sen. Ralph Hutchins presided. Atlanta, GA. February 11, 2004.
- NATO CCMS.** Mediation of Nitrogen Transformation in Groundwater by Ferrous Iron. Nutrients Pilot Study Fourth Workshop. Bled, SLOVENIA. May 2002.
- NATO CCMS.** Session Chair of the Nutrient Processes Session. Nutrients Pilot Study Third Workshop. Tallin, ESTONIA. May, 2001.
- NATO CCMS.** Biogeochemistry of Denitrification. Nutrients Pilot Study Third Workshop. Tallin, ESTONIA. May, 2001.
- NATO CCMS.** Nutrients Process Studies. Nutrients Pilot Study Second Workshop. Athens, GA. May, 2000.

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

- USEPA Science Advisory Board** Workshop Series on Nutrients, nomination team for ad-hoc committee. 2004 - 2005.
- National Science Foundation** State/Industry/University Research Proposal Review Panel. Washington, D.C., February, 1991.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

- Provided OPPT with technical assistance as part of their negotiations with industry to arrive at an enforceable consent agreement on perfluorinated compounds.
- Leading Agency's exploration of the potential degradation of perfluorinated industrial and commercial products in soils and sediment, research that was requested of ORD by OPPT.
- Co-coordinator for the EPA/ORD wide PFOA workgroup.

PUBLICATIONS

- Greeman, D.A., A.W. Rose, J.W. Washington, R.R. Dobos, E.J. Ciolkosz. 1999. Geochemistry of Radium in Soils of the Eastern United States. *Applied Geochemistry*. 14. pp 365-385.
- Washington, J.W. 2000. The Possible Role of Volcanic Aquifers in Prebiologic Genesis of Organic Compounds and RNA. *Origins of Life and Evolution of the Biosphere*. INVITED. 30. pp 53-79.
- Washington, J.W., B.A. Cameron. 2001. Elucidating a Cause for the Gap in Field Vs. Lab k_{deg} for Organic Contaminants Using Analytic Models. *Environmental Toxicology and Chemistry*. 20. pp. 1909-1915.
- Washington, J.W., D. Endale, L. Samarkina, K.C. Chappell. 2004. Kinetic Control of Oxidation State at Thermodynamically Buffered Potentials. *Geochimica et Cosmochimica Acta*. 68. 4831-4842.
- Washington, J.W., L.P. Samarkina. 2005. Control of $[NO_3^-]$ Flowing from Aquifers to Surface-Water Bodies by Fe^{2+} in Humid, Subtropical Climates. Chapter 3.3 in R. Russo (ed.). *Modeling Nutrient Loads and Response in River and Estuary Systems*. NATO/CCMS, Brussels, Belgium.
- García-Luque, E., J.M. Forja, A. Gómez-Parra, J.W. Washington. 2005. Nutrient Reactivity in the Guadalquivir Estuary (SW Spain) using Simulation Techniques. Chapter 3.2 in R. Russo (ed.). *Modeling Nutrient Loads and Response in River and Estuary Systems*. NATO/CCMS, Brussels, Belgium.
- Washington, J.W., R.C. Thomas, D. Endale, K. Schroer, L. Samarkina. 2006. Groundwater N Speciation and Redox Control of Organic N Mineralization. *Geochimica et Cosmochimica Acta*. 70. 3533-3548.

BIOGRAPHICAL SKETCH

NAME: Karen Watanabe

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Northwestern University	B.S.	1986	Chemical Engineering
University of California, Berkeley	M.S.	1990	Mechanical Eng
University of California, Berkeley	Ph.D.	1993	Mechanical Eng

PROFESSIONAL EXPERIENCE

- 7/05 to present Assistant Professor, Department of Environmental and Biomolecular Systems, Oregon Health & Science University
- 7/06 – 6/09 Adjunct Assistant Professor, Department of Environmental Health Sciences, Tulane University
- 9/03-6/05 Research Assistant Professor, Department of Environmental and Biomolecular Systems, Oregon Health & Science University
- 9/03 - 8/05 Adjunct Assistant Professor, Department of Environmental Health Sciences, Tulane University
- 8/95-8/03 Research Assistant Professor, Department of Environmental Health Sciences, Tulane University
- 7/01-6/02 Adjunct Professor of Civil and Environmental Engineering, Tulane University.
- 2/94-8/95 Senior Research Assistant, Risk Analysis Section, Oak Ridge National Laboratory
- 9/91-12/93 Research Assistant, University of California, Berkeley
- 3/90-8/91 Graduate Student Researcher, California Environmental Protection Agency
- 9/88-3/90 Research Assistant, University of California, Berkeley
- 3/87-8/88 Hazardous Waste Manager, Day-Glo Color Corporation

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Environmental Toxicology and Chemistry
Society for Risk Analysis

SELECTED AWARDS AND HONORS

- 11/04 NATO/CCMS Study Visit Grant: Travel expenses to attend the Pilot Study meeting on Advanced Cancer Risk Assessment in Lyon, France.
- 9/98 NATO/CCMS Fellowship: Supported international travel and miscellaneous expenses related to participation in the Advanced Cancer Risk Assessment Pilot Study. Participants are invited from the NATO countries and the Cooperation Partner countries.

INVITED LECTURES/SYMPOSIA

- April 2006 Watanabe, K. H. (2006). Linking Engineering and Biology: A road to computational models of biological systems. Presented at the Introduction to Engineering Class Lecture, Invited by J. Brosing, Pacific University, April 17.
- March 2005 “Chemical Dynamics in Aquatic Organisms” presented at the Nonlinear Systems Group Seminar, Math Department, Portland State University, March 4.

- April 2002 "Spatial Network Modeling of Bioaccumulation in Aquatic Food Webs" presented at the National Institute for Industrial Environment and Risks (INERIS), Verneuil en Halatte, France.
- May 2001 Invited speaker at the NATO Advanced Research Workshop on "Endocrine Disrupters and Carcinogenic Risk Assessment" in Bialystok, Poland. Two lectures were given, "Pharmacokinetics I: Fundamentals of Physiologically-Based Toxicokinetic Models" and "Pharmacokinetics II: Physiological Modeling and Its Role in the Paradigm of Biologically Based Risk Assessment."

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Pacific Northwest SETAC Board of Directors, Academia-at-Large

PUBLICATIONS

(Publications represent 6 out of a total of 13 for the period 1998-2006)

- Pankow, J. F., **Watanabe, K. H.**, Toccalino, P. L., Luo, W. and Austin, D. F. (accepted). Toxicant deliveries and associated cancer risks for conventional and "potentially reduced exposure product" cigarettes. *Cancer Epidemiology Biomarkers and Prevention*.
- Watanabe, K. H.**, Lin, H., Bart Jr., H. L., Martinat, P., Means, J. C., Kunas, M. L. and Grimm, D. A. (2005). Bayesian estimation of kinetic rate constants in a food web model of polycyclic aromatic hydrocarbon bioaccumulation. *Ecological Modelling* 181(2-3): 229-246.
- Watanabe, K. H.** (2005). Modeling Exposure and Target Organ Concentrations. In: *Quantitative Methods in Cancer and Human Health Risk Assessment*. L. Edler and C. Kitsos, Eds. Chichester, West Sussex, United Kingdom, John Wiley & Sons: 115-124.
- Lin, H., Berzins, D. W., Myers, L., George, W. J., Abdelghani, A. and **Watanabe, K. H.** (2004). A Bayesian approach to parameter estimation for a crayfish (*Procambarus Spp.*) bioaccumulation model. *Environmental Toxicology and Chemistry* 23(9): 2259-2266.
- Watanabe, K. H.**, Desimone, F. W., Thiagarajah, A., Hartley, W. R. and Hindrichs, A. E. (2003). Fish tissue quality in the lower Mississippi River and health risks from fish consumption. *The Science of the Total Environment* 302(1-3): 109-126.
- Luebeck, E. G., Travis, C. and **Watanabe, K.** (1999). Informative case studies. In: *Perspectives on Biologically Based Cancer Risk Assessment*. V. J. Cogliano, E. G. Luebeck and G. A. Zapponi, Eds. New York, Kluwer Academic/Plenum Publishers: 275-308.

NARRATIVE

My research program seeks to understand the dynamics of living systems through the development of mathematical and computational models. I apply my bioengineering background in developing computational models of biological systems. Currently, my research focuses on developing a physiologically based model of the reproductive axis in fathead minnows that will link molecular-level gene and protein expression with reproductive effects from exposure to endocrine disrupting chemicals. Past research projects included modeling the trophic transfer of polycyclic aromatic hydrocarbons in the aquatic environment, modeling the pharmacokinetics of chemical xenobiotics in multiple species. In the future, my research will continue to focus on the development of physiologically based models that integrate multiple levels of biological scale, from gene expression to larger-scale physiological effects.

BIOGRAPHICAL SKETCH

NAME: Lidia S. Watrud

POSITION TITLE: Project Leader

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
City College of New York, NY	B.S.	1963	Biology
Michigan State University, East Lansing	M.S.	1965	Mycology/ Genetics
Michigan State University, East Lansing	Ph.D.	1972	Mycology/ Genetics,

PROFESSIONAL EXPERIENCE

1991-present: Ecologist, US Environmental Protection Agency ORD NHEERL-WED, Corvallis, OR

1986-90: Manager, Commercial Development of New Technologies, Plant Sciences Dept., Monsanto Co., St. Louis, MO

1984-86: Manager, Environmental Microbiology and Molecular Biology, Monsanto Co., St. Louis, MO

1982-84: Senior Research Group Leader, Crop Protection Dept., Monsanto Co., St. Louis, MO

1977-1982: Senior Research Specialist and Group Leader, Cell Biology Group and Crop Protection Dept., Monsanto Co., St. Louis, MO

1973-1975: Post-Doctoral Fellow, Dept. of Agronomy, and Visiting Assistant Professor, Dept. of Microbiology, University of Illinois, Urbana

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS:

Sigma Xi Research Honorary

American Association for the Advancement of Science

American Society for Microbiology

Ecological Society of America

Member of Editorial Board: World Journal of Agricultural Sciences, 2006-08;

Environmental Toxicology Chemistry, 1999-present; Molecular Ecology, 1992-1997

SELECTED AWARDS AND HONORS

US EPA Scientific and Technological Achievement Award: Level I, 2005

US EPA National Honor Award: Gold Medal for Exceptional Service, Gene Flow Project Research Team, 2005

US EPA ORD National Honor Award: Bronze Medal, Biotechnology Steering Committee, 2005

US EPA NHEERL Goal 5 Award: Future Issues, 2005

US EPA NHEERL Western Ecology Division Team Honor Awards: 1999, 2000, 2004

Member, Synergy Team, US EPA, NHEERL. 2001-present

Superior Contributions Performance Awards: 1997, 1999, 2000, 2002-2006

SELECTED INVITED LECTURES/SYMPOSIA

Molecular Breeding of Turf Workshop/International Grassland Congress. July 2005. Invited speaker.

Pollen-mediated gene flow from genetically modified herbicide resistant creeping bentgrass plants. Aberystwyth, Wales, UK.

Introgression from Genetically Modified Plants (GMP) into wild relatives and its consequences. January 2003.

Invited workshop organizer. Amsterdam, the Netherlands.

Third International Conference on Mycorrhiza. July 2001. Effects of transgenic plants on mycorrhizae. Invited workshop organizer and speaker. University of Adelaide, AU

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Member, Research Subcommittee on Biotechnology for the 21st Century, National Science and Technology Council, 1994-95

US Interagency/European Community Biotechnology Task Force; representative for US EPA NHEERL. 2001

Member, Federal Inter-Agency Work Group of President's National Science and Technology Council. Provide US EPA ORD inputs and co-author research initiative for federal agencies entitled Biotechnology in the 21st Century." 1997-1999

Adjunct Professor, Department of Botany, Oregon State University 1992-present

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Member, US EPA Workgroups for Proposed/Final Rules on Microbial Pesticides and Pesticidal Plants, 1993-1994

Member, US EPA, NHEERL Genomics Coordination Group. 2001-present

Member, US EPA, Office of Research and Development, Work Group on Proposed Rules for Plant Pesticides. 1997-1999

PUBLICATIONS

Reichman, J.R., Watrud, L.S., Lee, E.H., Burdick, C.A., Bollman, M.A., Storm, M.J., King, G.A. and Mallory-Smith, C. 2006. Establishment of transgenic herbicide-resistant creeping bentgrass (*Agrostis stolonifera* L.) in non-agronomic habitats. *Molecular Ecology*, doi: 10.1111/j.1365-294X.2006.03072.x.

Watrud, L.S., Misra, S., Gedamu, L., Shiroyama, T., Maggard, S. and G. Di Giovanni. 2006. Ecological risk assessment of alfalfa (*Medicago varia* L.) engineered to express a human metallothionein (hMT) gene. *Water, Air and Soil Pollution* 176:329-349.

Watrud, L.S., Martin, K., Donegan, K.K., Stone, J.K. and C.G. Coleman. 2006. Comparison of taxonomic, colony morphotype, and PCR-RFLP methods to characterize microfungi diversity. *Mycologia* 98 (3):384-393.

Watrud, L.S., E.H. Lee, A. Fairbrother, C. Burdick, J.R. Reichman, M. Bollman, M. Storm, G. King and P.K. Van de Water. 2004. Evidence for landscape-level, pollen-mediated gene flow from genetically modified creeping bentgrass with CP4 EPSPS as a marker. *Proceedings of the National Academy of Sciences* 101(40):14533-14538.

Compton, J.E., L.S. Watrud, L.A. Porteous, S. DeGroot. 2004. Response of soil microbial biomass and community composition to chronic nitrogen additions at Harvard forest. *Forest Ecology and Management* 196:143-158.

Watrud, L.S., Maggard, S., Shiroyama, T., Coleman, C.G., Johnson, M.G., Donegan, K.K., DiGiovanni, G., Porteous, A.L., and E. H. Lee. 2003. Bracken (*Pteridium aquilinum* L.) frond biomass and rhizosphere microbial community characteristics are correlated to edaphic factors. *Plant and Soil* 249:359-371.

Hobbie, E.A., Watrud, L.S., Maggard, S., Shiroyama, T., and P.T. Rygielwicz. 2003. Carbohydrate use and assimilation by litter and soil fungi assessed by carbon isotopes and BIOLOG® assays. *Soil Biol. & Biochem.* 35: 303-311.

Winton, L. M., J.K. Stone, L.S. Watrud, and E.M. Hansen. 2002. Simultaneous one-tube quantification of host and pathogen DNA with real-time polymerase chain reaction. *Phytopathology* 92:112-116.

Donegan, K.K., L. S. Watrud, R. J. Seidler, S. P. Maggard, T. Shiroyama, L. A. Porteous, and G. Di Giovanni. 2001. Soil and litter organisms in Pacific northwest forests under different management practices. *Appl. Soil Ecol.* 18:159-175.

Watrud, L.S., 2000. Genetically Engineered Plants in the Environment -- Applications and Issues, Pages 59-79 in N.S. Subbarao and Y.R. Dommergues, *Microbial Interactions in Agriculture and Forestry*, Vol. 2. Oxford and IBH Publishing Co, New Delhi.

Di Giovanni, G.D., L.S. Watrud, R.J. Seidler, and F. Widmer. 1999. Comparison of parental and transgenic alfalfa rhizosphere communities using Biolog GN metabolic fingerprinting and enterobacterial repetitive intergeneric consensus sequence-PCR (ERIC-PCR). *Microbial Ecol.* 37:129-139.

Widmer, F., R.J. Seidler, P.M. Gillevet, L.S. Watrud, and G.D. Di Giovanni. 1998. A

- highly selective PCR protocol for detecting 16S rRNA genes of the genus *Pseudomonas* (sensu stricto) in environmental samples. *Appl. Environ. Microbiol.* 64(7):2545-2553.
- Entry, J.A., L.S. Watrud, and M. Reeves. 1998. Accumulation of 137Cs and 90Cs by three grass species inoculated with mycorrhizal fungi. *Environ. Pollution* 100:1-9.
- Porteous, L.A., R.J. Seidler, and L.S. Watrud. 1997. An improved method for purifying DNA from soil for polymerase chain reaction amplification and molecular ecology applications. *Molec. Ecol.* 6:787-791.
- Widmer, F., R.J. Seidler, and L.S. Watrud. 1996. Sensitive detection of transgenic plant marker gene persistence in soil microcosms. *Molec. Ecol.* 5:603-613.
- Watrud, L.S., and R.J. Seidler. 1996. Ecological effects of plant, microbial and chemical introductions to terrestrial systems. Pages 313-340 in P.M. Huang, editor. *Soil Chemistry and Ecosystem Health*. Special Publication No. 52, Soil Science Society of America, SSSA, ASA, Madison, WI.

NARRATIVE

Development and use of molecular ecology methods to study the effects of genetically engineered plants and other biotic and abiotic stressors on plant community composition, plant/microbe interactions in the rhizosphere, and ecosystem function and sustainability.

BIOGRAPHICAL SKETCH

NAME: William J. Welsh

POSITION TITLE: Norman H. Edelman
Professor in Bioinformatics,
Department of Pharmacology

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
St. Joseph's University, Phila, PA	B.S.	1969	Chemistry
University of Pennsylvania, Phila, PA	Ph.D.	1975	Physical Chemistry
University of Cincinnati, Cincinnati, OH	Postdoc	1979-82	Comput Biophys Chem

PROFESSIONAL EXPERIENCE

1975-79 Research Chemist, Procter & Gamble Co. (Cinti., OH)
1979-86 Professor of Chemistry, College of Mount St. Joseph
1982-86 Research Associate Professor of Chemistry, University of Cincinnati
1986-90 Assistant Professor of Chemistry, Univ. of Missouri-St. Louis (UM-St. Louis)
1990-95 Associate Professor, UM-St. Louis
1995-2001 Full Professor, UM-St. Louis
2001- Professor, Dept. of Pharmacology, UMDNJ-RWJMS
2001- Director, UMDNJ Informatics Institute
2003- Norman H. Edelman Chaired Professorship, UMDNJ-RWJMS
2005- Director, UMDNJ Environmental Bioinformatics & Computational Toxicology Center

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

1985 Extramural Research Associate, National Institutes of Health, Bethesda, MD
1991-1999 Member, Editorial Board, *Journal of Computational and Theoretical Polymer Science*
1997-2001 Associate Director, UM-St. Louis Ctr. for Molecular Electronics
1999-2001 Associate Director, University of Missouri Bioinformatics Center
1999-2001 Director, UM-St. Louis Center for Cheminformatics
2000-2003 Member, Editorial Advisory Bd, *Journal of Computer Information and Chemical Sciences*
2001- Member, Cancer Institute of New Jersey
2002- Member of Graduate Faculty, UMDNJ-Rutgers U. Environ. & Occup. Health Sci. Inst. (EOHSI)
2002- Member, New Jersey Center for Biomaterials
2003- Member of Graduate Faculty, Medicinal Chemistry, School of Pharmacy, Rutgers Univ.
2003- Editorial Board, *Journal of Molecular Graphics & Modelling*
2003- Editorial Board, *Chemical Research in Toxicology* Journal
2005- Editorial Board, *Cancer Informatics* Journal

SELECTED AWARDS AND HONORS

1985 *Teacher of the Year Award*, College of Mount St. Joseph, Ohio
1998 *St. Louis Award*, St. Louis Section of the American Chemical Society
2001 University of Missouri *Entrepreneur of the Year Award*
2001 UM-St. Louis *Chancellor's Award for Research and Creativity*
2003 Norman H. Edelman Endowed Professorship in Bioinformatics, UMDNJ-RWJMS
2004 *John C. Krantz, Jr. Lectureship Award*, University of the Sciences in Philadelphia (USP).

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Ongoing Research Support

4. Three-Dimensional Quantitative Structure-Activity Relationship Study of the Inhibition of the Na⁺,K⁺-ATPase by Cardiotonic Steroids Using Comparative Molecular Field Analysis, CD Farr, C Burd, MR Tabet, X Wang, WJ Welsh, and WJ Ball, Jr., *Biochemistry*, **41**, 1137-1148 (2002).
5. Molecular Interaction of the Antagonist SR141716 with the CB₁ Cannabinoid Receptor, J-Y Shim, W. J. Welsh, E Cartier, J Edwards, and A C Howlett, *J Med Chem*, **45**(7), 1447-1459 (2002).
6. Three-Dimensional Structure-Activity Relationship Modeling of Cocaine-Binding to Two Monoclonal Antibodies, S Paula, M Tabet, S Keenan, WJ Welsh, WJ Ball Jr., *J Mol Biol*, **325**, 515-530 (2003).
7. QSAR Models in Receptor-Mediated Effects: The Nuclear Receptor Superfamily, H. Fang, W. Tong, W. J. Welsh, and D. M. Sheehan, *J Mol Struct (Theochem)*, **622**, 113-125 (2003).
8. Quantitative Structure-Activity Relationship Methods: Perspectives on Drug Discovery and Toxicology, R. Perkins, H. Fang, W. Tong, W. J. Welsh, *Environ Toxicol Chem*, **22**, 1666-79 (2003).
9. Characterization of the Plasmodium falciparum PK5 ATP-Binding Site: Implications for the Design of Novel Antimalarial Agents, S. M. Keenan, W. J. Welsh, *J Mol Graph Model*, **22**, 241-247 (2003).
10. Predicting Ligand Binding Affinities for the Wild-Type Androgen Receptor and a Mutated Variant Linked with Prostate Cancer, N Ai, RK DeLisle, S Yu, WJ Welsh, *Chem. Res. Toxicol*, **16**, 1652-60 (2003).
11. Tea Polyphenol (-)-Epigallocatechin-3-Gallate Inhibits DNA Methyltransferase and Reactivates Methylation-Silenced Genes in Cancer Cell Lines, M Z Fang, Y Wang, N Ai, Z Hou, Y Sun, H Lu, WJ Welsh, C S Yang, *Cancer Research* **63**, 7563-7570 (2003).
12. Shape Signatures: A New Approach to Computer-Aided Ligand- and Receptor-Based Drug Design, RJ Zauhar, G Moyna, L Tian, Z Li, WJ Welsh, *J Med Chem*. **46**, 5674-5690 (2003).
13. Identification of possible kinetically significant anion-binding sites in human serum transferrin using molecular modeling strategies, EA Amin, WR Harris, and WJ Welsh. *Biopolymers*, **73**(2), 205-15 (2004).
14. Gaussian mixture clustering and imputation of microarray data, M Ouyang, WJ Welsh, and P Georgopoulos, *Bioinformatics*, **12**, 917-23 (2004).
15. Identification of a Minimal Subset of Receptor Conformations for Improved Multiple Conformation Docking and Two-Step Scoring, S. Yoon, W. J. Welsh, *J Chem. Inf. Comput. Sci.*, **44**(1), 88-96 (2004).
16. Detecting hidden sequence propensity for amyloid fibril formation, S Yoon, WJ Welsh, *Protein Science* **13**, 2149-60 (2004).
17. Tumor-targeted bioconjugate based delivery of camptothecin: design, synthesis and in vitro evaluation, PV Paranjpe, Y Chen, V Kholodovych, WJ Welsh, S Stein, PJ Sinko, *J Control Release* **100**, 275-92 (2004).
18. Enrichment of Ligands for the Serotonin Receptor Using the Shape Signatures Approach, K Nagarajan, R Zauhar, WJ Welsh, *J Chem Inf Model* **45**, 49-57 (2005).
19. Rational inhibitor design and iterative screening in the identification of selective plasmodial cyclin dependent kinase inhibitors, SM Keenan, JA Geyer, WJ Welsh, ST Prigge, NC Waters, *Comb Chem High Throughput Screen* **8**(1):27-38 (2005).
20. Benzotropolone inhibitors of estradiol methylation: kinetics and in silico modeling studies, JD Lambert, D Chen, CY Wang, N Ai, S Sang, C-T Ho, WJ Welsh, CS Yang, *Bioorg & Med Chem* **13**, 2501-2507 (2005).
21. Comparative Molecular Field Analysis on Opioid Receptor Antagonists: Pooling Data from Different Studies, Y Peng, SM Keenan, Q Zhang, V Kholodovych, WJ Welsh. *J Med Chem* **48**, 1620-29 (2005).
22. Inhibition of human liver catechol-O-methyltransferase by tea catechins and their metabolites: Structure-activity relationship and molecular-modeling studies. D Chen, CY Wang, JD Lambert, N Ai, WJ Welsh, CS Yang. *Biochem Pharmacol*. **69**, 1523-31 (2005).
23. Requirement of activated Cdc42-associated kinase for survival of v-Ras-transformed mammalian cells. Nur-E-Kamal A, Zhang A, Keenan SM, Wang XI, Seraj J, Satoh T, Meiners S, Welsh WJ. *Mol Cancer Res*. **3**(5):297-305 (2005).
24. Rapid assessment of contact-dependent secondary structure propensity: Relevance to amyloidogenic sequences. Yoon S, Welsh WJ. *Proteins*. **60**(1):110-117 (2005).
25. Improved method for predicting {beta}-turn using support vector machine. Zhang Q, Yoon S, Welsh WJ *Bioinformatics*. **21**(10):2370-4 (2005).

BIOGRAPHICAL SKETCH

NAME: Tracy L. Whitehead

POSITION TITLE: Chemist

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Mississippi State University	B.S.	1994	Chemistry
Mississippi State University	M.S.	1997	Analytical Chemistry
Mississippi State University	Ph.D.	1999	Analytical Chemistry

PROFESSIONAL EXPERIENCE

- 2005-Present *Chemist*, U.S. Environmental Protection Agency, Processes and Modeling Branch, Ecosystems Research Division, NERL, Athens, GA
- 2004-2005 *Adjunct Assistant Professor*, Department of Biochemistry & Molecular Biology, Graduate School, University of Arkansas for Medical Sciences, Little Rock, AR
- 2003-2005 *Adjunct Assistant Professor*, Department of Pharmaceutical Sciences, College of Pharmacy, University of Arkansas for Medical Sciences, Little Rock, AR
- 2003-2005 *Research Assistant Professor*, Department of Pathology, College of Medicine, University of Arkansas for Medical Sciences, Little Rock, AR
- 2000-2003 *Assistant Professor*, Department of Chemistry, Henderson State University, Arkadelphia, AR
- 1999-2000 *NIH Postdoctoral Scholar*, Department of Biochemistry & Molecular Genetics, University of Alabama – Birmingham, Birmingham, AL

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Society of Toxicology, International Society for the Study of Xenobiotics, American Chemical Society, Sigma Xi
Editorial Board: *Journal of Biomolecular Structure & Dynamics*

SELECTED AWARDS AND HONORS

- 2006 EPA NERL Special Achievement Award (Community Service)
2006 EPA Science Forum 3rd Place Poster (Disease Susceptibility and the Environment category)
2006 ACS Certificate of Merit (Environmental Chemistry Division)

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Manuscript Reviewer: *Journal of Chemical Education, Environmental Toxicology & Chemistry, Spectroscopy Letters, Biomacromolecules, Journal of Biomolecular Structures & Dynamics, Metabolomics*

PUBLICATIONS

(10 of 20)

Whitehead, T.L.; Kieber-Emmons, T. Applications of *in vitro* NMR spectroscopy and ¹H-NMR metabonomics to breast cancer characterization and detection, *Prog. NMR Spectroscopy* 2005, 47, 165-174.

Whitehead, T.L.; Monzavi-Karbassi, B.; Kieber-Emmons, T. ^1H -NMR-based metabonomics analysis of sera differentiates between mammary tumor-bearing mice and healthy controls, *Metabolomics* 2005, 1, 269-278.

Monzavi-Karbassi, B.; Whitehead, T.L.; Jousheghany, F.; Artaud, C.; Hennings, L. Shaaf, S.; Slaughter, A.; Korourian, S.; Kelly, T.; Blaszczyk-Thurin, M; Kieber-Emmons, T. Deficiency in surface expression of E-selectin ligand promotes lung colonization in a mouse model of breast cancer, *Int. J. Cancer* 2005, 117, 398-408.

Whitehead, T.L.; Monzavi-Karbassi, B.; Jousheghany, F.; Artaud, C.; Kieber-Emmons, T. ^1H -NMR metabolic markers of malignancy correlate with spontaneous metastases in a murine mammary tumor model, *Int. J. Oncol.* 2005, 27, 257-264.

Wen, Y.; Mancino, A.; Pashov, A.; Whitehead, T.; Stanley, J.; Kieber-Emmons, T. Antigen Binding of Human IgG Fabs Mediate ERK-Associated Proliferation of Human Breast Cancer Cells, *DNA Cell Biol.* 2005, 24, 73-84.

Whitehead, T.L.; Watson, M.E. Use of ^{113}Cd and ^{207}Pb Nuclear Magnetic Resonance Spectroscopy and Flame Atomic Absorption Spectroscopy to study the Binding of Toxic and Carcinogenic Metals to Calcium Proteins. *Spectrosc. Lett.* 2004, 37, 105-114.

Whitehead, T.L.; Holmes, W.E.; Flores, B.J.; Leidensdorf, J.W. Using Solid-phase Microextraction Gas Chromatography-Mass Spectrometry and High Performance Liquid Chromatography with Fluorescence Detection to analyze Fluorescent Derivatives of the Biogenic Amines Creatine and Creatinine. *Spectrosc. Lett.* 2004, 37, 95-103.

Whitehead, T.L.; Jones, L.M.; Hicks, R.P. PFG-NMR Investigations of the Binding of Cationic Neuropeptides to Anionic and Zwitterionic Micelles. *J. Bio. Struct. Dyn.* 2004, 21, 567-576.

Whitehead, T.L. and Hicks, R.P. Rationale for using simple and complex micelles in polypeptide conformational analysis, in Recent Research Developments in Medicinal Chemistry, Transworld Research Network, Transworld Publishing Co., India, 2002.

Whitehead, T.L.; Jones, L.M.; Hicks, R.P. Effect of the incorporation of CHAPS into SDS Micelles on Neuropeptide-Micelle Binding: Separation of the Role of Electrostatic Interactions from Hydrophobic Interactions. *Biopolymers* 2001, 58, 593-605.

NARRATIVE

Tracy joined the staff of the ERD in January of 2005 as a NERL postdoctoral appointee in the Computational Toxicology program. His current research efforts focus on using NMR spectroscopy and LC-MS/MS spectrometry to analyze the effects of xenobiotic endocrine disrupting compound (EDC) exposure on endogenous metabolite levels in small fish, primarily zebrafish (*Danio rerio*). In addition, he is investigating the application of NMR spectroscopy, capillary electrophoresis, and LC-MS/MS to urine samples for rapid analysis of metabolic perturbations caused by exposure to industrial and environmentally-relevant chemicals.

BIOGRAPHICAL SKETCH

NAME: Douglas C. Wolf

POSITION TITLE: Veterinary Medical Officer

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
University of Missouri-Columbia, MO	D.V.M.	1981	Veterinary Medicine
Purdue University, West Lafayette, IN	Ph.D..	1991	Veterinary Pathology

PROFESSIONAL EXPERIENCE

August 2005 – present Acting Branch Chief USEPA, ORD, NHEERL, ECD, CBB
August 1999 – August 2005 Veterinary Medical Officer USEPA, ORD, NHEERL, ECD, CBB
May 1, 1999-July 31, 1999 Acting Branch Chief USEPA, ORD, NHEERL, ECD, BPB
1997- April 30, 1999 Veterinary Medical Officer, USEPA, ORD, NHEERL, ECD, BPB
1991-1997 Scientist, Chemical Industry Institute of Toxicology, Research Triangle Park, NC.
1987-1991 Graduate Instructor, Veterinary Pathology, Purdue University, West Lafayette, IN.
1983-1987 Associate Veterinarian, Olin Animal Hospital, St. Paul, MN.
1982-1983 Relief Veterinary Services, Minneapolis, MN.
1981-1982 Associate Veterinarian, Norwood Veterinary Clinic, Norwood, MN.

PROFESSIONAL ACCREDITATION

Fellow of the International Academy of Toxicologic Pathology (IATP), 2004

PROFESSIONAL SOCIETIES

American Veterinary Medical Association
Society of Toxicologic Pathology
Society of Toxicology

SELECTED AWARDS AND HONORS

Who's Who in American Colleges and Universities, 1981
Phi Zeta Veterinary Honor Society, 1989
Board of Publications Award for the Best Paper in *Fundamental and Applied Toxicology* for 1994
USEPA Bronze Medal 7/98 for The bromate group project for the Office of Water
USEPA Bronze Medal 6/04 for The ORD Computational Toxicology Design Team
USEPA Bronze Medal 6/04 for Promoting Strong Science in Agency Decisions
USEPA Exceptional/Outstanding ORD Technical Assistance To The Regions Or Program Offices 9/06 for DMA Team OPP Support Award: For Support in Providing the Scientific Basis of the Mode of Action Analysis for *Cacodylic Acid* to the Office of Pesticides Programs.

SELECTED INVITED LECTURES/SYMPOSIA

European Centre for Toxicologic Pathology, Conference on Molecular Pathology. The Royal Veterinary College, University of London, Hawkshead, England, 7-8 Oct, 2004. (4 lectures)
Duke University Nicholas School of the Environment and Earth Sciences, ENV 298.13 "Seeing the big picture: lessons from watershed mangement in California". Presentation: An Overview of Water Purification Methods and Health Considerations of Water Disinfection By-products. 26 October, 2004

The U.S. EPA Computational Toxicology Program: Improving Linkages in the Source-to-Outcome Continuum. Committee to assess the application of toxicogenomics technologies to predictive toxicology, National Academy of Sciences, Washington DC, Jan 12, 2005

Interpreting Chemically-Induced Renal Lesion for Safety and Risk Assessment. American College of Toxicology, Pathology for the Non-pathologist. Chicago, IL, May 11, 2005

Interpreting Chemically-Induced Renal Lesion for Safety and Risk Assessment, The Toxicologic Pathology of the Liver. IRIS/NCEA/USEPA Program for Chemical Managers. Washington DC, May 24, 2005.

Toxicogenomics in Chemical Carcinogenesis Research. Immunotoxicogenomics Workshop, Research Triangle Park, NC, Sept 27, 2005.

HESI technical committee on agricultural chemical safety assessment (ACSA) Systemic toxicity task force report. American College of Toxicology annual meeting, Williamsburg, VA, Nov 6, 2005

An Overview of Water Purification Methods and Health Considerations of Water Disinfection By-products. North Carolina Central University, November 9, 2005

Value of Mode of Action Research in Risk Assessment. U.S. EPA Workshop on Research and Risk Assessment for Arsenic. Shepherdstown, WV, June 1, 2006

Guidance on Mode of Action Analysis and Human Relevancy: An Agency Perspective: In Application of the Human Relevance Framework to the Analysis of Rodent Tumor Data. Continuing Education Course, Society of Toxicologic Pathology, Annual meeting, Vancouver, BC, Canada; June 18, 2006.

Use of New Technologies to Define Common Pathways of Toxicity, Conazole as an Example. In: SESSION V Cumulative Risk: Common Mechanisms of Action. The Toxicology Forum 32nd annual summer meeting, July 10-13, 2006 Aspen, CO

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Pathology Working Groups, the NTP/NIEHS, Research Triangle Park, NC, 1991-present

The Copernicus Group, Independent Review Board, 1996 to 2000

Peer Review, Toxicology Excellence for Risk Assessment, 1997-present

Review Ethylene Glycol Risk Assessment, Health Canada. 8/2001

Councilor, Toxicologic and Exploratory Pathology Specialty Section of SOT, 2002-2005.

Agricultural Chemical Safety Assessment Project. ILSI/HESI, 2002-2003

Society of Toxicologic Pathologists, Continuing Education Committee, chair 2000-2003.

Adjunct Associate Professor, College of Veterinary Medicine, North Carolina State University

Adjunct Professor, College of Veterinary Medicine, Virginia Polytechnic Institute, Blacksburg, VA

Adjunct Associate Professor, School of Medicine, University of North Carolina, Chapel Hill, NC

Adjunct Associate Professor, Curriculum in Toxicology, University of North Carolina, Chapel Hill, NC

Editorial Board: *Toxicologic Pathology* - 1998-2002

Associate Editor: *Toxicologic Pathology* - 2002 -2004

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Volume 88. Formaldehyde, 2-butoxyethanol and 1-tert-2-glycyl-propanol. (in press)

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

NHEERL Drinking Water Research Implementation Team, 2001-2003

NHEERL Synergy Committee, Division representative and co-chair. 2002-2003

ORD Computational Toxicology Framework Design Team, 2002-2003

ORD Computational Toxicology Implementation Planning Team, 2003-

Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization Based on Emerging Information. NCEA-1-0503, 2002

Summary report of the colloquium on the use of medaka in risk assessment processes. U.S. Environmental Protection Agency, Risk Assessment Forum, Washington, DC, . 01 Jan 2003.

A Framework for a Computational Toxicology Research Program in ORD. U. S Environmental Protection Agency, Office of Research and Development, EPA/600/R-03/065, November 2003

Genomics Task Force US EPA, coordinating committee; and Data-Submission Subcommittee-co-chair, 2004-2006

Risk Assessment Forum US EPA, Health Effects Subcommittee, 2004-
Systemic Toxicity White Paper of the Technical Committee on Agricultural Chemical Safety Assessment. ILSI/HESI
Technical Report, January 2005
Interim Guidance for Microarray-Based Assays: Regulatory and Risk Assessment Applications at EPA. Genomics
Task Force, U.S. EPA, Guidance Document. March, 2006

PUBLICATIONS

(2005 to present, 32 out of 107 journal articles, book chapters, and technical reports):

1. Kavlock R, Ankley GT, Collette T, Francis E, Hammerstrom K, Fowle J, Tilson H, Toth G, Schmieder P, Veith GD, Weber E, Wolf DC, Young D: Computational Toxicology: Framework, Partnerships, and Program Development: A Workshop Report. *Repro Toxicol* 19:265-280, 2005
2. Wolf DC, Mann PC: Confounders in interpreting pathology for safety and risk assessment. *Toxicol Appl Pharmacol* 202:302-308, 2005 (invited)
3. Tietge JE, Holcombe GW, Flynn KM, Kosian PA, Korte JJ, Anderson LE, Wolf DC, Degitz SJ: Metamorphic inhibition of *Xenopus laevis* by sodium perchlorate: effects on development and thyroid histology. *Environ Toxicol Chem* 24:926-933, 2005.
4. Hester SD, Zou F, Barry W, Wolf DC: Use of gene profiling to differentiate a carcinogenic from a noncarcinogenic aldehyde in the rat nose. *Toxicol Pathol* 33:415-424, 2005.
5. McDorman KS, Pachkowski BF, Nakamura J, Wolf DC, Swenberg JA: Oxidative DNA damage from potassium bromate exposure in rats is not enhanced by a mixture of drinking water disinfection by-products. *Chemico Biol Interact* 152:107-117, 2005.
6. Sen B, Wang A, Hester SD, Robertson JL, Wolf DC: Gene expression profiling of bladder transitional cell epithelium from female F344 rats exposed to dimethylarsinic acid in the drinking water. *Toxicology* 215:214-226, 2005.
7. Grasty RC, Bjork JA, Wallace KB, Wolf DC, Lau CS, Rogers JM: Effects of prenatal perfluorooctane sulfonate (PFOS) exposure on lung maturation in the prenatally rat. *Birth Defects Res (Part B)* 74:405-416, 2005
8. Khan MA, Fenton SE, Swank AE, Knapp GW, Hester SD, Wolf DC: Short-term low-level exposure effects of individual or mixtures of ammonium perchlorate and sodium chlorate on the pituitary-thyroid axis in male F-344 rats. *Toxicol Pathol* 33:776-783, 2005.
9. Doe JE, Boobis AR, Blacker A, Dellarco V, Doerrer NG, Franklin C, Goodman JI, Kronenberg JM, Lewis R, McConnell EE, Mercier T, Moretto A, Nolan C, Padilla S, Phang W, Solecki R, Tilbury L, van Ravenzwaay B, Wolf DC: A Tiered Approach to Systemic Toxicity Testing for Agricultural Chemical Safety Assessment. *Crit Rev Toxicol* 36:37-68, 2006.
10. Sun G, Thai SF, Lambert GR, Wolf DC, Tully DB, Goetz AK, George M, Grindstaff RD, Dix DJ, Nesnow S: Fluconazole induced hepatic cytochrome P450 gene expression and enzymatic activities in rats and mice. *Toxicol Lett* 164:44-53, 2006.
11. Tully DB, Bao W, Goetz AK, Ren H, Schmid JE, Blystone CR, Strader LF, Wood CR, Best DS, Narotsky MG, Barone S, White LD, Wolf DC, Rockett JC, Dix DJ: Gene Expression Profiling in Liver and Testis of Rats to Characterize the Toxicity of Triazole Fungicides. *Toxicol Appl Pharmacol* (in press)
12. Goetz AK, Bao W, Ren H, Schmid JE, Tully DB, Wood C, Rockett JC, Narotsky MG, Sun G, Lambert GR, Wolf DC, Nesnow S, Muslin R, Stolovitzky, Dix DJ: Gene Expression Profiling in the Liver of CD-1 Mice to Characterize the Hepatotoxicity of Triazole Fungicides. *Toxicol Appl Pharmacol* (in press)
13. Rockett JC, Narotsky MG, Thompson KE, Thillainadarajah I, Blystone CR, Goetz AK, Ren H, Best DS, Murrell RN, Nichols HP, Schmid JE, Wolf DC, Dix DJ: Effect of conazole fungicides on reproductive development in the female rat. *Repro Toxicol* (in press).
14. Wang A, Holladay S, Wolf D, Ahmed SA, Robertson J: Reproductive and developmental toxicity of arsenic in rodents: a review. *Int J Toxicol* (in press)
15. Wolf DC, Allen JW, George M, Hester SD, Sun G, Thibodeaux J, Moore T, Thai S-F, Delker D, Ernest Winkfield E, Leavitt S, Nelson G, Roop B, Jones C, Nesnow S: Toxicity Profiles in Rats Treated with Triazole Conazole Fungicides: Propiconazole, Triadimefon, and Myclobutanil. *Toxicol Pathol* (in press)
16. Allen JW, Wolf DC, George MH, Sun G, Thai SF, Delker D, Nelson G, Moore T, Hester SD, Winkfield E, Roop B, Leavitt S, Jones C, Ward W, Nesnow S: Toxicity Profiles in Mice Treated with Hepatotumorigenic and Non-Hepatotumorigenic Triazole Conazole Fungicides: Propiconazole, Triadimefon, and Myclobutanil. *Toxicol*

Pathol (in press)

17. Hester SD, Wolf DC, Nesnow S, Thai S-F: Transcriptional Profiles in Liver from Rats Treated with Triazole Conazole Fungicides: Propiconazole, Triadimefon, and Myclobutanil. Toxicol Pathol (in press)

18. Ward W, Delker D, Hester SD, Thai S-F, Wolf DC, Allen JW, Nesnow S: Transcriptional Profiles in Liver from Mice Treated with Hepatotumorigenic and Non-Hepatotumorigenic Triazole Conazole Fungicides: Propiconazole, Triadimefon, and Myclobutanil. Toxicol Pathol (in press)

19. Rayner JL, Enoch RR, Wolf DC, Fenton SE: Atrazine-induced reproductive tract alterations after transplacental and/or lactational exposure in male Long-Evans rats. Toxicol Appl Pharmacol (in press)

BIOGRAPHICAL SKETCH

NAME: Xibiao YE POSITION TITLE:ORISE Postdoctoral Fellow

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Jiangxi Medical College	B.Med.	1996	Preventive Medicine
Shanghai Medical University	M.Med.	1999	Occupational and Environmental Health
Fudan Univeristy	Ph.D.	2003	Occupational and Environmental Health

PROFESSIONAL EXPERIENCE

Apr 2006-, Postdoctoral Fellow, National Exposure Research Laboratory, US EPA/RTP, NC

Jan 2002-Apr 2006, Assistant Director for Administration, Sino-US Clinical and Molecular Laboratory, Fudan University, China.

Jul 2002-Apr 2006, Lecturer, Department of Preventive Medicine, School of Public Health, Fudan University, China

Jul 1999- Jun 2002, Research and Teaching Assistant, Department of Preventive Medicine, School of Public Health, Shanghai Medical University, China

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

Shanghai Society of Environmental Teratogenesis, China, 2004-present

SELECTED AWARDS AND HONORS

Science and Technology Award, Shanghai Association of Medicine, 2004

Excellent Teaching Award, Shanghai Education Committee, 2004

Excellent Young Teacher Award, Fudan University, 2003

Medical Education Scholarship of The United Laboratories, Fudan University, 2002

INVITED LECTURES/SYMPOSIA

X.B. Ye, H. Fu. Longitudinal birth cohort studies in understanding children's environmental health. 2005 Shanghai International Pediatric Forum-Children's Environmental Health Satellite Meeting, Shanghai, Jun, 2005.

X.B. Ye. Associations between polymorphisms of δ -aminolevulinic acid dehydratase and vitamin D receptor genes and lead toxicity. International Society of Environmental Epidemiology Conference, New York, Aug, 2004.

X.B. Ye,H. Fu.Biomarkers in occupational epidemiology studies. 13th National Occupational Health Conference, Chongqing, 2002.

X.B. Ye. Environmental Genomics: a case study in lead exposure. Public Health Seminar, Fudan University Anniversary, 2002.

X.B. Ye, W.M. Ni, H. Fu. Oxidative damages induced by lead exposure. 1st National Conference on Free Radical

Species in Occupational Medicine, Wuxi, Oct 1998.

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Development of analytical methods for perfluorinated compounds in biological matrices.

PUBLICATIONS

X.B. Ye, O. Wong (2006). Lead exposure, lead poisoning, and lead regulatory standards in China, 1990-2005. *Regulatory Toxicol Pharma*, (in press)

X.B. Ye, H Fu (2006). Epidemiological studies on gene polymorphisms and risk of Non-Hodgkin's Lymphoma. *Hyg Res*, 35(3):384-386.

R.D Irons, L. Lv, S.A. Gross, **X.B. Ye**, L.M. Bao, X.Q. Wang, J. Ryder, T.W. Armstrong, Y.M. Zhou Yimei, L.Z. Miao, P.J. Kerzic, H Fu (2005). Chronic exposure to benzene results in a unique form of dysplasia. *Leuk Res*. 29(12):1371-1380.

Y.X. Liang, O. Wong, T.W. Armstrong, **X.B. Ye**, L.Z. Miao, Y.M. Zhou, Q.E. Wu, H.J. Qian, H. Fu (2005). An overview of published benzene exposure data by industry in China, 1960-2003. *Chem Biol Interact*. 153-154:55-64.

X.B. Ye, O. Wong, H Fu (2005). World at work: health hazards of foot massage industry in China. *Occup. Environ Med*. 62:902-904.

X.B. Ye, S.L. Yang, C.E. Wu, Y. W. Lu, W.M. Ni, H. Fu (2003). Associations of blood lead levels, kidney function and blood pressure with δ -aminolevulinic acid dehydratase and vitamin D receptor gene polymorphisms. *Toxicology Mechanisms and Methods*, 13:139-147.

X.B. Ye, H. Fu, J.L. Zhu, W.M. Ni, S.L. Yang (1999). A study on oxidative stress (DNA damage) in workers exposed to lead. *J Toxicol Environ Health*, 56 (A):161-172.

X.B. Ye (2004). Genetic susceptibility of toxicity. In: *Modern Toxicology* (Jin Taiyi, editor), Fudan University Press, Shanghai, China (in Chinese).

X.B. Ye (2004). Basic principles and methods of epidemiology. In: *Public Health and Community Nursing* (Feng Zhengyi, editor), Fudan University Press, Shanghai, China, (in Chinese).

X.B. Ye, Y.W. Lu, C.E. Wu (2004). Influence of d-Aminolevulinic Acid Dehydratase (ALAD) Gene Polymorphism on Hormone Levels in Lead Workers. *J Occup. Environ. Med*, 21(2):101-103 (in Chinese).

X.B. Ye, H. Fu, W.M. Ni (2001). ALAD gene polymorphism and blood lead levels: a meta-analysis. *Guandong Weiliang Yuansu Kexue*, 8(9):22-26 (in Chinese).

X.B. Ye, H Fu, W.M. Ni (2001). Cancer mortality of lead-exposed workers in Shanghai, China: a retrospective cohort study. *Chin J Ind Hyg Occup Dis*, 19(2):108-112 (in Chinese).

X.B. Ye, H. Fu (2000). DNA damage among lead-exposed workers determined by Comet Assay. *Chin J Ind Hyg Occup Dis*, 18(1):45-47 (in Chinese).

BIOGRAPHICAL SKETCH

NAME: Valerie G. Zartarian POSITION TITLE: Research Environmental Engineer

EDUCATION/TRAINING

Institution	Degree	Year	Field of Study
Stanford University	Ph.D.	1997	Environmental Engineering and Science
Stanford University	M.S.	1993	Environmental Engineering and Science
Princeton University	B.S.	1989	Civil Engineering, Water Resources

PROFESSIONAL EXPERIENCE

Research Environmental Engineer, EPA/ORD/NERL/HEASD 1998-present
Postdoctoral Research Affiliate, Stanford University, Civil Engineering Department, Environmental Engineering and Science Program 1997-1998
Course Founder and Co-Instructor, Stanford University, Advanced Topics in Human Exposure to Environmental Pollutants (graduate seminar) 9/97-12/97
Lecturer, Stanford Air Quality Management Course (undergraduate) 1/95-3/95
Water Resources Engineer, Camp, Dresser, & McKee, Inc., Boston, MA 1989-1991

PROFESSIONAL SOCIETIES & PUBLICATION BOARDS

International Society of Exposure Analysis: 1992-present
 Councilor Representing Government Sector, 7/1/02-6/30/05
 Terminology Subcommittee, 2004-2005
 Awards Committee Member, 10/10/02-6/30/05
Society for Risk Analysis, Member: 2003, 2000
Sigma Xi Scientific Research Society: Associate Member, 1989-1998
Toastmasters International, Camp Dresser & McKee, Inc. Chapter: President, 1991; Secretary, 1990

SELECTED AWARDS AND HONORS

ORD/NERL/HEASD/EMRB Special Accomplishment Recognition Award. 2005, 2006
ORD Honor Award for Exceptional/Outstanding ORD Technical Assistance to the Regions. 2003
ORD Honor Award for Exceptional/Outstanding ORD Technical Assistance to the Program Offices. 2002
OPP Superior Accomplishment Recognition Award for applying the SHEDS model to assess children's exposure and dose to arsenic and chromium from CCA-treated wood on playsets and decks. 2002
EPA Bronze Medal for Commendable Service: outstanding work in area of human exposure and health science. 2001
International Society for Exposure Analysis, Joan Daisey Outstanding Young Scientist Award. 2000

INVITED LECTURES/SYMPOSIA (14 of a total of 50+ for the last 5 years)

The Stochastic Human Exposure and Dose Simulation (SHEDS) Model and its application to pyrethroids through collaboration with OPP, OPP/HED/CEB, August 8, 2006, Arlington, VA.
ORD/OPP n-methyl-carbamate collaboration using the SHEDS-Multimedia model, OPP/HED/CEB, August 8, 2006, Arlington, VA.
Quantifying Aggregate Chlorpyrifos Exposure and Dose to Children Using a Physically-Based Two-stage Monte Carlo Probabilistic Model, Society for Risk Analysis Conference, December 7-10, 2003, Baltimore, MD
Summary of SHEDS-Wood Model Methodology and Inputs for CCA Assessment, OPP FIFRA Scientific Advisory Panel, December 3-5, 2003, Arlington, VA
Assessing Children's Exposures to Pesticides: Important Applications of the Stochastic Human Exposure and Dose Simulation (SHEDS) Model, poster at US EPA Science Forum, May 5-7, 2003, Washington, DC

A New Tool to Assess Dermal and Multimedia Multipathway Exposures to Environmental Chemicals: EPA/ORD's SHEDS Model and its Role in Improving Risk Assessment and Risk Management Decisions, presented to EPA Office of Solid Waste (OSW) Risk Team Meeting, February 6, 2003, Arlington, VA

CCA Probabilistic Assessment: Acting Deputy Administrator Briefing (to EPA/ORD and EPA/OPPT DAAs), November 2003, by telephone

Quantifying Aggregate Pesticide Exposure and Dose to Children using a Physically-Based Probabilistic Model, Harvard University, March 24, 2003, Boston, MA

SHEDS-Pesticides: Children's Exposure and Dose to Arsenic and Chromium from CCA-Treated Playsets and Home Decks, briefing on CCA to Stephen Johnson, EPA Office of Pollution Prevention and Toxics, Assistant Administrator, April 2002, Washington, DC

Using the SHEDS Model to Assess Children's Exposure and Dose from Treated Wood Preservatives on Playsets and Residential Decks, EPA Office of Pesticide Programs FIFRA (Federal Insecticide, Fungicide, Rodenticide Act) Scientific Advisory Panel Meeting, August 30, 2002, Arlington, VA

Modeling Exposure and Dose of Children to Wood Treatment Preservatives from Playsets and Home Decks, 2002, International Society for Exposure Analysis Conference, August 2002, Vancouver, B.C.

EPA/ORD/NERL's Stochastic Human Exposure and Dose Simulation (SHEDS) Model, EPA Office of Pollution Prevention and Toxics, Washington, DC, July 15, 2002, Arlington, VA

Overview of EPA/ORD/NERL Pesticide Exposure Modeling Research, Briefing to EPA/ORD Assistant Administrator
Paul Gilman, NERL Mid-Year Review, June 18, 2002, Research Triangle Park, NC

Panel Discussion of Results from Residential Aggregate Exposure Assessment Models, 2001, International Society for Exposure Analysis Conference, November 2001, Charleston, SC

ASSISTANCE/LEADERSHIP PROVIDED TO THE SCIENTIFIC COMMUNITY

Lead, development of official glossary of the International Society of Exposure Analysis, 2004-05

Councilor Representing Government Sector, International Society of Exposure Analysis (7/1/02-6/30/05)

Editorial Board Member, Journal of Children's Health, 5/03-05

Session Co-Chair, Comparison of Aggregate Residential Exposure Models – Parts I and II, International Society for Exposure Analysis Conference, November, 2001, Charleston, SC

Member, Harmonization of Chemical Exposure Assessment Terminology Workgroup, World Health Organization, International Programme on Chemical Safety, Project on the Harmonization of Approaches to the Assessment of Risk from Exposure to Chemicals: Exposure Assessment Terminology, March, 2000 to present

Session Rapporteur, Methodological Issues and Model Requirements Session, Aggregate Exposure Assessment Model Evaluation and Refinement Workshop, International Life Sciences Institute, Health and Environmental Sciences Institute, October 19-21, 1999, Baltimore, MD

Session Co-Chair, Pesticides Exposure and Health, International Society for Exposure Analysis Conference, September, 1999, Athens, Greece

Session Co-Chair, Modeling Uncertainty and Variation in Time-Varying Exposures, Society for Risk Analysis Conference, December 1999, Atlanta, GA

ASSISTANCE/LEADERSHIP PROVIDED TO THE AGENCY

Co-developer of ORD/NERL research plan for community-based cumulative risk, 2006-present

Research Track Lead, source-to-dose modeling section of EPA/ORD Human Health Multi-Year Plan, 2006

Peer Reviewer, revised Child-Specific Exposure Factors Handbook, 2006

Lead, glossary for updated EPA Exposure Assessment Guidelines, 2006-present

Member, Exposure Factors Program Advisory Group, to provide NCEA/ORD with recommendations regarding needs and priorities on exposure factors for updating the EPA Exposure Factors Handbook, 2005

Member, Risk Assessment Forum workgroup for developing Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants, 2003-05

Member, Planning Committee, Children's Health Risk Assessment Workshop on Increasing Uniformity of Exposure Assessments for Children, EPA's Risk Assessment Forum, March, 1999 to July, 2000

co-Principal Investigator, WAM, TOPO for ORD/NERL research on Multimedia, Multipathway Probabilistic Human Exposure and Dose Model Development and Applications:
 Assisted in developing ORD/NERL's task descriptions, budget plans, research abstracts, and long-term strategic planning for multimedia, multipathway exposure modeling (1998-present)
 Lead, Exposure Modeling component of ORD's research to support OPP's risk assessment for pyrethroids (2003-present)
 Co-lead, Applying ORD/NERL probabilistic exposure model to support OPP's cumulative risk assessment for n-methyl carbamates (2006)
 Co-lead, ORD/NERL probabilistic exposure model to support OPP/AD's Risk Assessment for Children Exposed to Arsenic and Chromium from CCA-Treated Wood, 2001-2005

Session co-chair, member, national and international conferences, workgroups, technical committees (1999-present)
 Exposure modeling liaison to ORD/NERL university partners (EOHSI/LBNL) (1999-present)
 Co-Organizer, EPA's Aggregate Residential Exposure Model Comparison Workshop, Research Triangle Park, NC, October 10-11, 2001 (collaborated with EPA, Office of Pesticide Programs, Health Effects Division)
 Co-Organizer, EPA's Workshop on Micro/Macro-Activity Data Needs to Improve Multi-Media, Multi-Pathway Exposure/Intake Dose, May 17-18, 2001, Research Triangle Park, NC

SELECTED PUBLICATIONS

- Zartarian V.G., Ott W., Liroy P., Chapter 2: Basic Concepts and Definitions of Exposure and Dose, in: Exposure Analysis, eds. Ott, Steineman, Wallace, CRC Press, Catalog no. L1663, September 2006, c. 512 pp. ISBN: 1-56670-663-7.
- Zartarian V.G., Xue J., Ozkaynak H., Dang W., Glen G., Smith L., Stallings C., 2006, "A Probabilistic Arsenic Exposure Assessment for Children Who Contact CCA-Treated Playsets and Decks, Part 1: Model Methodology, Variability Results, and Model Evaluation," *Risk Analysis*, Vol. 26, No. 2, 2006 pp. 515-531.
- Xue J., Zartarian V.G., Ozkaynak H., Dang W., Glen G., Smith L., Stallings C., 2006, "A Probabilistic Arsenic Exposure Assessment for Children Who Contact Chromated Copper Arsenate (CCA)-Treated Playsets and Decks, Part 2: Sensitivity and Uncertainty Analyses," *Risk Analysis*, Vol. 26, No. 2, 2006 pp. 533-541.
- U.S. EPA, 2005, Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants, Risk Assessment Forum, EPA/630/P-03/003F, NCEA, Washington, DC., coauthors M. Firestone, E. Hubal, J. Moya, V. Zartarian.
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