

## DWRLB Scientific Publications/Presentations:

### Publications:

Lowering detection limits for 1,2,3-trichloropropane in water using solid phase extraction coupled to purge and trap sample introduction in an isotope dilution GC-MS method, W. Liao, M. Ghabour, W. M. Draper, E. Chandrasena, *Chemosphere*, 2016, 158, 171-176.

Optimizing LC-MS-MS determination of microcystin toxins in natural water and drinking water supplies, William M. Draper, Dadong Xu, Paramjit Behniwal, Michael J. McKinney, Prasanna Jayalath, Jagdev S. Dhoot, Donald Wijekoon, *Anal. Methods*, 2013, 5(23), 6796-6806.

Identification of Volatile and Semivolatile Compounds in Chemical Ionization GC-MS Using a Mass-To-Structure (MTS) Search Engine with Integral Isotope Pattern Ranking, Wenta Liao and William M. Draper, *Analyst*, 2013, 138 (4), 1038-47.

Evaluation of variability and quality control procedures for a receptor-binding assay for paralytic shellfish poisoning toxins. Ruberu, S.R., Langlois, G.W., Masuda, M., Perera, S.K. *Journal of Food Additives & Contaminants: Part A*, 2012, 29, 1770 - 1779.

Electrolyte-induced Ionization Suppression in Microcystin Toxins: Ammonium Formate Suppresses Sodium Replacement Ions and Enhances Protonated and Ammoniated Ions for Improved Specificity in Quantitative LC-MS-MS. William M. Draper, Dadong Xu and S. Kusum Perera, *Anal. Chem.* 2009, 81 (10), 4153-4160.

Identification of Unknowns in API Mass Spectrometry Using a Mass to Structure (MTS) Search Engine, Wenta Liao, William M. Draper, and S. Kusum Perera, *Anal. Chem.*, 2008, 80 (20), 7765-7777.

Direct Determination of Dialkyl Phosphates by Strong Anion Exchange Liquid Chromatography Atmospheric Pressure Chemical Ionization Mass Spectrometry Using a Quadrupole Ion Trap Instrument, William M. Draper, Paramjit Behniwal, and Donald Wijekoon, *Rapid Communications in Mass Spectrometry* 2008, 22, 2613-2620.

An improved liquid scintillation counting method for the determination of gross alpha activity in groundwater wells. Ruberu, S.R., Liu, Y-G., Perera, S.K. *Journal of the Health Physics Society*, 2008, 95(4), 397-406.

Occurrence and Distribution of Pb-210 and Po-210 in California Groundwater Determined by a Single Sample Method. Ruberu, S.R., Liu, Y-G., Perera, S.K. *Journal of Health Physics*, 2007, 92(5), 432-441.

Testing for Persistent Organic Pollutants in Banked Maternal Serum Specimens, William M. Draper, J. Liang, M. Fowler, M. Kharrazi, P. Flessel, K. Perera, In: Assessing Exposures and

Reducing Risks to People from the Use of Pesticides, R. Krieger, N. Ragsdale and J. Seiber (eds), American Chemical Society Symposium Series No. 951, ACS, Washington, DC, 2007.

Occurrence of  $^{224}\text{Ra}$ ,  $^{226}\text{Ra}$ ,  $^{228}\text{Ra}$ , Gross Alpha, and Uranium in California Ground Water. Ruberu, S.R., Liu, Y-G, Perera, S.K *Journal of Health Physics*, 2005, 89(6), 667-678.

A Receptor Binding Assay for Paralytic Shellfish Poisoning Toxins: Optimization and Interlaboratory Comparison. Ruberu, S.R., Liu, Y-G., Wong, C.T., Perera, S.K., Langlois, G.W., Doucette, G.J., Powell, C.L. *Journal of AOAC International*, 2003, 86, 737-745.

California Biomonitoring Plan, Project Staff: P. Flessel, W. Draper, K. Perera, L. Copan, T. Quach, C. Arnesen, E. Blake and J. Liang, California Department of Health Services, 2003 ([www.dhs.ca.gov/ehlb/BPP](http://www.dhs.ca.gov/ehlb/BPP)).

Atmospheric Pressure Ionization LC-MS-MS Determination of Urushiol Congeners, William M. Draper, D. Wijekoon, M. McKinney, P. Behniwal, S. Kusum Perera, and C. Peter Flessel, *J. Agric. Food Chem.* 2002, 50, 1852-1858. Paper of the month in journal.

Near UV Quantum Yields for Rotenone and Piperonyl Butoxide, William M. Draper, *Analyst*, 2002, 127, 1370-1374.

Electrospray LC-Quadrupole Ion Trap-MS Determination of Phenyl Urea Herbicides in Water. William M. Draper *J. Agric. Food Chem.* 2001, 49, 2746-2755.

Levels of DDT in Breast Milk of Los Angeles Women. D. Smith, W. M. Draper, G. Pollock and P. J. Papanek, Jr., California Department of Health Services, 2001.

Biological Monitoring: Exquisite research probes, risk assessment, and routine exposure measurement. William M. Draper, *Analytical Chemistry*, 2001, 73(12), 2745-2760 (2-Year Industrial Hygiene Applications Review). Among the most-Accessed, ACS Web Edition Articles in *Analytical Chemistry*: July-September, 2007.

Multiresidue HPLC Methods for Phenyl Urea Herbicides in Water, Shiyamalie R. Ruberu, William M. Draper and S. Kusum Perera, *J. Agric. Food Chem.* 2000, 48, 4109-4115.

Trace-level Determination of 1,4-Dioxane in Water by Isotope Dilution GC and GC-MS. W. M. Draper, J. S. Dhoot, J. W. Remoy and S. K. Perera, *Analyst*, 2000, 125, 1403-1408.

Industrial Hygiene Chemistry: Keeping Pace with Rapid Change in the Workplace. (2-Year Applications Review) W. M. Draper, K. Ashley, C. R. Glowacki and P. R. Michael, *Analytical Chemistry*, 1999, 71, 33-60.

Determination of Rotenoids and Piperonyl Butoxide in Water, Sediments and Piscicide Formulations. W. M. Draper, J. S. Dhoot and S. K. Perera, *Journal of Environmental Monitoring*, 1999, 1, 519-524.

Getting Reliable Data from Water Labs Testing for MTBE (or any Other Volatile Contaminant), Proceedings of the National Groundwater Association Southwest Focused Conference on MTBE and Perchlorate in Groundwater, June 3-4, 1998, Anaheim, CA.

Detection Limits of Organic Contaminants in Drinking Water, W. Draper, J. Dhoot, J. Dhaliwal, J. Remoy, S. Perera and F. Baumann, *AWWA Journal* 1998, 90, 82-90.

Why MDLs Vary Widely Between Laboratories, W. Draper, S. K. Perera, and F. J. Baumann, In the Proceedings of the 20th Annual USEPA Conference on Analysis of Pollutants in the Environment, Norfolk, VA, May, 1997.

Pesticide exposures to children from California's central valley: Results of a pilot study. M. A. Bradman, M. Harnly, W. Draper, S. Seidel, S. Teran, D. Wakeham and R. Neutra, *Journal of Exposure Analysis and Environmental Epidemiology* 1997, 7, 217-234.

The Genetic Toxicology of Malathion: Results of an epidemiologic study in agricultural worker and *in vitro* laboratory studies. Acknowledged contribution to report from Kim Belshe, Director, California Department of Health Services, November, 1996.

A Community-based Epidemiologic Study of Acute Health Effects from a Metam-sodium Spill on California's Sacramento River, R. Kreutzer, D. Hewitt, R. Sun, W. Draper, D. Mangiamele, L. Goldman, R. Jackson, D. Smith and D. Shusterman, *Toxicology and Industrial Health* 1996, 12, 267-275.

Determination of diesel fuel and motor oil in water and wastes by a modified diesel-range organics total petroleum hydrocarbon method. W. Draper, J. Dhaliwal, S. Perera and F. Baumann, *J. AOAC International* 1996, 79 (March/April), 1-12.

Applications of new HPLC/MS techniques in human biomonitoring, W. Draper, F. Brown, R. Bethem, M. Miille, and C. Becker, In: Applications of Molecular Biology in Environmental Chemistry, edited by R. Minear, N. Karch, L. Needham, and A. Ford, Lewis Publishers, Inc., Chelsea, MI, May, 1995.

Optimizing nitrogen-phosphorus detector gas chromatography for pesticide analysis. W. M. Draper, *J. Agric. Food Chem.* 1995, 43, 2077-2082.

Malathion diacid in urine samples from Dekalb County, Georgia. Final report of a professional services contract to the Centers for Disease Control and Prevention, Atlanta, GA (PHS/USDHHS). W. Draper. California Public Health Foundation, October, 1995, 16 pages.

Estimating malathion doses in California's Medfly eradication campaign using a physiologically-based pharmacokinetic model. M. H. Dong, W. M. Draper, P. J. Papanek, Jr., J. H. Ross, K. A. Woloshin, and R. D. Stephens, In: Environmental Epidemiology: Effects of Environmental Chemicals on Human Health, edited by W. Draper, ACS Advances in Chemistry Series No. 241, American Chemical Society, Washington, DC, 1994.

An epidemiological assessment of the Cantara metam-sodium spill: Acute health effects and methyl isothiocyanate exposures. R. A. Kreutzer, D. J. Hewitt, and W. M. Draper, In: Environmental Epidemiology: Effects of Environmental Chemicals on Human Health, edited by W. Draper, ACS Advances in Chemistry Series No. 241, American Chemical Society, Washington, DC, 1994.

Toxicology and risk assessment. A. L. Craigmill, S. Wetzlich, and W. M. Draper, In: Environmental Epidemiology: Effects of Environmental Chemicals on Human Health, edited by W. Draper, ACS Advances in Chemistry Series No. 241, American Chemical Society, Washington, DC, 1994.

Rate constants for metam-sodium cleavage and photodecomposition in water, W. M. Draper and D. E. Wakeham, *J. Agric. Food Chem.* 1993 41, 1129-1133.

## **Presentations**

Chemical Terrorism Panel Discussion. James Chithalen, Shellie Lima, Caryn Thornburg  
Moderator: Sauda Yerabati. Presented at the Path to Preparedness Emergency  
Preparedness Training Workshop, Sacramento, California June 27-29, 2016

LRN-C Level I Lab, DWRLB, CDPH: Outreach and Coordination Strategy. Sauda Yerabati.  
Presented at the DEODC meeting, CDPH, Richmond, January 11, 2016; Sacramento  
County Public Health Laboratory meeting, Sacramento, January 19, 2016.

Overview of the Chemical Laboratory Response Network. Sauda Yerabati. Presented at  
the Joint Meeting of Alameda, Contra Costa and Solano County Hospital Safety Officers/  
Emergency Managers, January 20, 2016.

Chemical Laboratory Response Network (LRN-C). Sauda Yerabati. Presented at the  
Contra Costa County Operational Area Council Meeting, January 20, 2016; Placer County  
Public Health Laboratory, February 3, 2017; LRN Conference Call, February 10, 2016; San  
Joaquin County Public Health Laboratory, March 3, 2016; San Bernardino County Public  
Health Laboratory, March 15, 2016; San Diego County Public Health Laboratory, March  
17, 2016; Contra Costa County Public Health Laboratory, May 3, 2016; Alameda County

Public Health Laboratory, June 17, 2016.

CHEMICAL TERRORISM : CDC Resources for California Hospitals + Specimen Packaging and Shipping Training for LRN-C testing. Sauda Yerabati. Presented at the Sentinel Lab Training at Placer County Public Health Laboratory, April 1, 2016; Alta Bates Summit Medical Center – Emergency Management Committee Meeting, May 13, 2016; Sentinel Lab Training at San Bernardino County Public Health Laboratory, June 6, 2016; Sentinel Lab Training at Orange County Public Health Laboratory, June 8, 2016.

Clinical Lab Response to Toxic Chemical Exposures: A PUBLICATION OF THE CONTINUING CHALLENGE HAZARDOUS MATERIALS WORKSHOP, Spring 2016. Published April 20, 2016.

RESPONSE TO CHEMICAL TERRORISM. The LRN-C : Your LAB Partners. Sauda Yerabati. Presented at San Ramon Valley Fire District Meeting, August 5th, 2016

Overview of drinking water radionuclide rule and the occurrence of radium in California ground water wells” Ruberu, S.R. – Monthly Seminar Series, Environmental Chemistry Laboratory, California Department of Toxic Substances Control, February 10, 2016, Berkeley, CA.

Progress Report and Method Development from the California LRN-C Level 1 CDC Lab. James Chithalen. Presented at the U. S. Centers for Disease Control and Prevention (CDC) Chemical Laboratory Response Network (LRN-C) Level 1 Meeting, Columbia, South Carolina, November 4, 2014.

Progress Report and Method Development from the California LRN-C Level 1 CDC Lab. James Chithalen. Presented at the U. S. Centers for Disease Control and Prevention (CDC) Chemical Laboratory Response Network (LRN-C) Level 1 Meeting, Jacksonville, Florida, April 16, 2014.

Progress Report and Method Development from the California LRN-C Level 1 CDC Lab. James Chithalen. Presented at the U. S. Centers for Disease Control and Prevention (CDC) Chemical Laboratory Response Network (LRN-C) Level 1 Meeting, Madison, Wisconsin, October 21, 2013.

Progress Report and Method Development from the California LRN-C Level 1 CDC Lab. James Chithalen and Prasanna Jayalath. Presented at the U. S. Centers for Disease Control and Prevention (CDC) Chemical Laboratory Response Network (LRN-C) Level 1 Meeting, Boston, Massachusetts, May, 2013.

Progress Report - California LRN-C Level 1 Laboratory Update. James V. Chithalen, Presented at the U. S. Centers for Disease Control and Prevention (CDC) Chemical

Laboratory Response Network (LRN-C) Level 1 Meeting, Scottsdale, AZ, November 16, 2012

Update - Determination of a Cyanide Metabolite, L-ATCA, in Human Urine by Automated SPE and Isotope Dilution LC-MS-MS. W. Draper, D. Rajapaksa, J.V. Chithalen, D. Wijekoon and K. Perera, Presented at the LRN-C Technical Meeting, Atlanta, GA, April 4, 2012

Progress Report and Use of The Mass-To-Structure Search Engine from the California LRN-C Level 1 CDC Lab. James Chithalen and William M. Draper, Presented at the U. S. Centers for Disease Control and Prevention (CDC) Chemical Laboratory Response Network (LRN-C) Level 1 Meeting, Bandera, Texas, March, 2011.

Determination of a Cyanide Metabolite, L-ATCA, in Human Urine by Automated SPE and Isotope Dilution LC-MS-MS. James V. Chithalen, William M. Draper, D. Wijekoon and K. Perera, Presented at the Laboratory Response Network National Meeting, October 14, 2010, San Diego, CA.

Improved Measurement of Sulfur Mustard Exposure: Hypochlorite Oxidation of  $\beta$ -lyase Metabolites to 1,1'-sulfonylbis-[2-(methylsulfonyl) ethane], 96-well plate SPE and Isotope Dilution LC-MS-MS. James V. Chithalen and William M. Draper. Poster presented at the Laboratory Response Network National Meeting, San Diego, CA, October 13-15, 2010

Progress Report from the California LRN-C Level 1 CDC Lab. William M. Draper, Presented at the U. S. Centers for Disease Control and Prevention (CDC) Chemical Laboratory Response Network (LRN-C) Level 1 Meeting, Oakland, California, April 2010.

Improved Determination of Sulfur Mustard Exposure: Hypochlorite Oxidation of Urinary- $\beta$ -Lyase Metabolites to 1,1'-Sulfonylbis[2-(methylsulfinyl)ethane], Automated 96 Well Plate and Isotope Dilution Electrospray LC-MS-MS with Simultaneous Column Regeneration, James V. Chithalen and William M. Draper, Presented as Agrochemicals Division Paper No. 262 (Poster) at the 239th American Chemical Society National Meeting and Exposition, San Francisco, CA, March 21-25, 2010.

Determination of the Cyanide Metabolite, L-2-Amino-2-Thiazoline-4R-Carboxylic Acid (L-ATCA), in Human Urine by Automated Solid Phase Extraction and Isotope Dilution LC-MS-MS, William M. Draper, D. Rajapaksa, J. Chithalen, D. Wijekoon and K. Perera, Presented at the Association for Mass Spectrometry Applications to the Clinical Lab (MSACL), 2010 Conference, San Diego, February, 2010.

Progress Report and Method Development from the California LRN-C Level 1 CDC Lab. William M. Draper, Presented at the U. S. Centers for Disease Control and Prevention (CDC) Chemical Laboratory Response Network (LRN-C) Level 1 Meeting, Jacksonville, Florida, April, 2009.

Blue Green Algae, Microcystins and Environmental Health, William M. Draper, Presented at the California Department of Public Health Director's All-Staff Meeting, December 5, 2008, Richmond, CA.

Identification of unknown chemical compounds in human specimens using a mass to structure (MTS) search engine for mass spectrometry data, William M. Draper, Wenta Liao and Dadong Xu, Presented at the Mass Spectrometry Applications to the Clinical Laboratory 2008 (MSACL '08) Meeting, November 1-5, 2008, San Diego, CA.

Improved LC-MS-MS Methods for Determination of Microcystins in Surface Water. William M. Draper, Presented at Metropolitan Water District of Southern California Water Quality Laboratory, La Verne, CA, February 24, 2008.

Overview and method development of gross alpha/gross beta analysis by liquid scintillation counting" Ruberu, S.R., Liu, Y-G, Perera, S.K – 52<sup>nd</sup> Annual Radiobioassay and Radiochemistry Measurements Conference, October 23-October 28, 2006, Chicago, IL.

Gross alpha beta analysis by liquid scintillation counting – overview and recent developments" Ruberu, S.R., Liu, Y-G – 52<sup>nd</sup> Annual Radiobioassay and Radiochemistry Measurements Conference, October 23-October 27, 2006, Chicago, IL.

Direct Determination of Dialkyl Phosphates (DAPs) by Strong Anion Exchange Atmospheric Pressure Chemical Ionization (APCI) LC-MS-MS, W. M. Draper, P. Behniwal, D. Wijekoon, Presented at the 54<sup>th</sup> Annual American Society of Mass Spectrometry (ASMS) Meeting (Poster No. 661), Seattle, WA, May, 2006.

Proficiency Testing for Water System Security Screening Methods, William Draper, Raimund Roehl, Wenta Liao, Dadong Xu, Paramjit Behniwal, Kusum Perera, Poster presented at the U. S. Centers for Disease Control and Prevention (CDC) Chemical Laboratory Response Network (LRN-C) Level 1 Meeting, Richmond, VA, April, 2006.

Results of the First California Mutual Aid Laboratory Network (CAMALNet) Proficiency Testing Study, William M. Draper and Raimund Roehl, Presented at the CAMALNet Progress Meeting, Metropolitan Water District of Southern California Headquarters Offices, Los Angeles, CA, April, 2006. (CAMALNet is a consortium of government and utility laboratories addressing water security, terrorism and emergency response).

How to Obtain Water Samples with the Emergency Water Quality Sampling Kit (EWQSK), William M. Draper and W. Liao, Presented to engineers and program staff of the California drinking water program, SRLB-Southern Section, Los Angeles, CA, May, 2005.

An LC-MS-MS Method for Anatoxin-a and Microcystin LR, W. M. Draper and D. Xu, Presented at the U. S. Centers for Disease Control and Prevention (CDC) Chemical Terrorism Level I Laboratory Network Meeting, Atlanta, GA, November, 2005.

Determination of Monochloropropanediol (MCPD) in Human Urine by Isotope Dilution GC-MS-MS, M. McKinney, D. Rajapaksa and William M. Draper, Presented at the U. S. Centers for Disease Control and Prevention (CDC) Chemical Terrorism Level I Laboratory Network Meeting, Atlanta, GA, November, 2005.

Occurrence and Distribution of Pb-210 and Po-210 in California Groundwater Determined by a Single Sample Method” Ruberu, S.R., Liu, Y-G, Perera, S.K – 51<sup>st</sup> Annual Radiobioassay and Radiochemistry Measurements Conference, October 24-October 28, 2005, Stateline, NV.

Gross Alpha/Beta Analyses of Groundwater by Liquid Scintillation Counting” Liu, Y-G, Ruberu, S.R., Perera, S.K – 51<sup>st</sup> Annual Radiobioassay and Radiochemistry Measurements Conference, October 24-October 28, 2005, Stateline, NV.

Occurrence and Distribution of <sup>224</sup>Ra, <sup>226</sup>Ra, <sup>228</sup>Ra, Uranium, and Gross Alpha in California Groundwater” Ruberu, S.R., Liu, Y-G, Perera – 50<sup>th</sup> Annual Conference on Bioassay, Analytical, and Environmental Radiochemistry, October 31-November 4, 2004, Cincinnati, OH

Issues on Radiochemical Methods on Drinking Water Analyses” Ruberu, S.R. – EPA 2<sup>nd</sup> Radiochemistry Workshop, September 22-23, 2004, Cincinnati, OH

Isotope Dilution: It’s Not Just for Mass Spectrometry Anymore, W. M. Draper, Presented to the U.S. Centers for Disease Control and Prevention (CDC) Chemical Terrorism Level III Laboratory Network Meeting, Oakland, CA, April, 2004.

Testing for Persistent Organic Pollutants in Banked Maternal Serum Samples, W. M. Draper, J. Liang, M. Kharrazi, P. Flessel and K. Perera, Invited presentation to the California Dept. of Health Services, Division of Environmental and Occupational Disease Control, Oakland, CA, January, 2004.

Surveillance of deliberate water system contamination. W. M. Draper, Invited presentation to the Bay Area Resources Council (of Public Drinking Water Utilities), Fremont, CA, March, 2002.

LC-MS Screening Methods to Detect Deliberate Contamination of the California Drinking Water Supply (Progress Report), W. M. Draper, Presented to the Metropolitan Water District Laboratory, LaVerne, CA, 2002.

The Chemical Counter-Terrorism Laboratory Network. W. J. Driskell, J. R. Barr, C. H. Buxton, A. Herz, L. L. Needham, T. Chapman, W. M. Draper, G. M. Frame, M. A. Martin, and J. F. Riebow, Paper presented at the 11<sup>th</sup> Annual Meeting of the International Society of

Exposure Analysis: An Integral Part of Disease Prevention, Charleston, S.C., November, 2001.

Near UV quantum yields for rotenone and piperonyl butoxide. W. M. Draper, Invited paper presented as part of the International Award for Research in Agrochemicals: Environmental Fate of Agrochemicals, 221<sup>st</sup> ACS National Meeting, San Diego, CA, 2001.

Analysis of Urushiol: Starting from Scratch, W. M. Draper, Presented to the Kenneth L. Maddy Equine Analytical Chemistry Laboratory, UC Davis School of Veterinary Medicine, 2001.

Dissipation of Rotenone Formulation Residues in Lake Davis. W. M. Draper, Presented as part of the University of California Berkeley Environmental Toxicology Seminar Series, October, 1998. (also presented to the University of San Francisco Environmental Management Program, October, 1998).

Monitoring the Dissipation of Piperonyl Butoxide in Lake Davis Using the Saturn 2000, William Draper, J. Dhoot and S. K. Perera, Presented at the Varian 2000 Users Group Meeting, Varian Instruments, Walnut Creek, CA, August, 1998.

Getting Reliable Data from Water Labs Testing for MTBE (or any other Volatile Contaminant), W. M. Draper, National Groundwater Association Meeting, Anaheim, CA, 1998.

Micropollutants that may Constrain Water Reuse Options. David Sedlak, Mark Chien, and William Draper, Abstract submitted for presentation at the Water Reuse Association Symposium XII, San Diego, October, 1997.

Toward Uniform Detection Limits for Organic Contaminants in Drinking Water, William Draper, Kusum Perera and Frank Baumann, Presented at the 20<sup>th</sup> Annual USEPA-Water Environment Federation Conference on the Analysis of Pollutants in the Environment, Norfolk, VA, 1997.

Detection Limits for Organic Contaminants in Drinking Water. W. Draper, J. Dhoot, J. Dhaliwal, S. K. Perera, and F. Baumann, Presented at the 213<sup>th</sup> American Chemical Society National Meeting, San Francisco, Environmental Chemistry Division Paper No. 143, 1997.