
BIOGRAPHICAL SKETCH

NAME

Wen-Yee Lee

eRA COMMONS USER NAME (credential, e.g., agency login)

WENYLEE

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
National Taiwan Normal University, Taipei, Taiwan	B.S.	07/1985	Chemistry
University of Texas at El Paso, El Paso, Texas	M.S.	12/1995	Organic Chemistry
University of Texas at El Paso, El Paso, Texas	Ph. D.	12/2000	Environmental Science and Engineering
Connecticut Agricultural Experiment Station	Post Doc. Training	2001-2002	Environmental Science

A. Personal Statement

The focus of my research has been on developing methods to analyze organic compounds in various environmental compartments (such as air, water, soil, and plants) and biological fluids (such as urine and saliva). Using a green sample preparation technique, called Stir Bar Sorptive Extraction (SBSE), coupled with Thermal Desorption and Gas Chromatography/Mass Spectrometry (GC/MS), we were able to reduce the use of harmful solvents, time and labor during sample preparation process. Our group has worked on studies of environmental endocrine disrupting compounds (EDCs), such as pharmaceuticals and estrogens, glucocorticoids, and polybrominated diphenol ethers, in wastewater and sludge samples, monitoring water quality in the Rio Grande and other water systems, investigating estrogenic activities of EDCs in reclaimed water, and developing techniques to remove EDCs in drinking water and wastewater.

As a co-investigator in the proposed clinical project in this BBRC RCMI U54 proposal, we will apply analytical chemistry to cancer marker discovery. We have developed method to effectively extract and analyze metabolites, i.e. volatile organic compounds (VOCs) in urine samples. We were able to demonstrate that SBSE coupled with GC/MS can efficiently extract urinary VOCs. My major tasks in this proposed project will focus on the development of cancer diagnostic marker. I will provide my expertise in analytical chemistry (especially in chemical analysis of VOCs and data processing to this project). We have gained significant expertise in VOC analysis and statistical modeling and will continue to explore the role of VOCs in cancer research. Combined with statistics, we have identified VOC markers for prostate cancer and renal cancer diagnosis. Our preliminary data with limited size of samples provide the prediction power for cancers with over 90% in sensitivity. We will collaborate with clinical researcher, Dr. Raj Ganesh, at UT Southwestern to further validate the model. Our goal is to develop a non-invasive, sensitive, and cost effective diagnostic tool for prostate cancer especially for clinically significant disease.

B. Positions and Honors

Positions and Employment

<u>Institution</u>	<u>Position</u>	<u>Dates</u>
Municipal Chien-Chen Senior High School	Chemistry Teacher	1985 - 1993
University of Texas at El Paso	Assistant Instructor, Chemistry	1998 - 2000
Connecticut Agricultural Experiment Station	Postdoctoral Scientist	2001 - 2002
University of Texas at El Paso	Assistant Professor, Chemistry	2003 - 2009
University of Texas at El Paso	Associate Professor, Chemistry	2009 - present

Professional Memberships

- Member, Society of Environmental Toxicology and Chemistry
- Member, American Chemical Society
- Member, Sigma Xi, the Scientific Research Society
- Member, Society for Advancement of Chicanos and Native Americans in Science

Honors

- Outstanding Assistant Instructor, Department of Chemistry, 1999, UTEP.
- Outstanding Graduate Research Award, 2000, Environmental Science and Engineering Program, UTEP.
- Distinguished Achievement Award for Teaching, College of Science, UTEP, May 2009
- UTEP Interdisciplinary Research (IDR) Fellow to the UTEP Office of Research and Sponsored Projects and the Office of the Provost, January 2016.

C. Contribution to Science

1. My research focuses on the analysis of endocrine disrupting compounds (EDCs) in water and wastewater. In recent years, the presence of EDCs in drinking water treatment and wastewater treatment plants (WWTPs) has been reported around the world. WWTPs cannot completely remove EDCs during the treatment processes, and as a result, EDCs often released into the environment via wastewater effluents. Our research investigates the presence of EDCs in wastewater, and established the baseline concentration of EDCs in our region. We also focus on studying the removal efficiency of EDCs by various treatment processes. El Paso, TX is located along the US and Mexico border and therefore is ideal to study the potential impact of EDCs in wastewater on the environment directly shared by two countries. I have served as the primary investigator in all these studies.
 - a. Rocha-Gutierrez, B.A., Lee, W.-Y., Walker, W.S. "Mass balance and mass loading of Polybrominated Diphenyl Ethers (PBDEs) in a tertiary wastewater treatment plant using SBSE- TD-GC/MS", *Water Science and Technology*, 2016; 73(2): 302-8. doi: 10.2166/wst.2015.492..
 - b. Rocha-Gutierrez, B.; Lee, W.-Y. "Investigation of Polybrominated Diphenyl Ethers in Wastewater Treatment Plants Along The US And Mexico Border: A Trans-Boundary Study" *Water, Air, & Soil Pollution*, 2013, 224 (1), 1398, DOI: 10.1007/s11270-012-1398-8.
 - c. Rocha-Gutierrez, B.; Lee, W.-Y. "Determination And Comparison Of Polybrominated Diphenyl Ethers In Primary, Secondary, And Tertiary Wastewater Treatment Plants", *International Journal of Environmental Analytical Chemistry*, 2012, 92(13), 1518-1531, DOI:10.1080/03067319.2011.585713.

- d. De La Torre-Roche, R.J. (Graduate Student); **Lee, W.-Y.**; Campos-Diaz, S.I. (Undergraduate Student) "Soil-borne polycyclic aromatic hydrocarbons in El Paso, Texas: Analysis of a potential problem in the United States/Mexico border region, *Journal of Hazardous Materials*, 2009, 163(2-3), 946 – 958.
2. In addition to the study of EDCs in wastewater, my research group also studies the removal of EDCs by natural setting or other absorbing materials. The goal is to provide remediation strategies for complete removal of EDCs in wastewater effluent before getting into the environment or in drinking water. I have served as the primary investigator and co-investigator in all these studies.
 - a. Toro-Velez, A.F., Lens, P.N.L., Madera-Parra, C.A., Peria-Var6n, M.R., Garcia-Hernandez, H., **Lee, W.Y.**, Walker, W.S., Longitudinal Removal of Bisphenol-A and Nonylphenols from Pretreated Domestic Wastewater by Tropical Horizontal Sub-Surface Constructed Wetlands. August 2017, *Applied Sciences* 7(8):834, DOI:10.3390/app7080834
 - b. Toro-Velez, A.F., Madera-Parra, C.A., Peria-Var6n, M.R., Lee, W.Y., Bezares-Cruz, J.C., Walker, W.S., Cardenas-Henao, H., Quesada-Calderon, S., Garcia-Hernandez, H., Lens, P.N.L. "BPA and NP removal from municipal wastewater by tropical horizontal subsurface constructed wetlands", *Science of the Total Environment*, Volume 542, Part A, 15 January 2016, 93-101.
3. In environmental research, samples often require lengthy preparation process which requires intensive man power as well as solvent consumption. We developed green analytical methods using solvent- less extraction methods to study semi-volatile compounds and EDCs in water and soil. We also incorporate biological assays to study the estrogenic activities in water and wastewater. I have served as the primary investigator and co-investigator in all these studies.
 - a. Yamaguchi, C.* , **Lee, W.-Y.**, "A cost effective, sensitive, and environmentally friendly sample preparation method for determination of Polycyclic Aromatic Hydrocarbons in solid samples", *Journal of Chromatography A*, 2010, 1217(44):6816-23.
 - b. Balsiger, H.A. de la Torre, R., **Lee, W.-Y.**, Cox, M.B. "A Four-Hour Yeast Bioassay for the Direct Measure of Estrogenic Activity in Wastewater without Sample Extraction, Concentration, or Sterilization" *Science of the Total Environment*, 2010, 408(6):1422-9, doi:10.1016/j.scitotenv.2009.12.027.
4. We have studied various organic compounds in plants and air to study the impact of organic compounds on plant physiology and on human health. I have served as the primary investigator and co-investigator in all these studies.
 - a. Rico, C., Morales, M., McCreary, R., Castillo-Michel, H., Barrios, A., Jong, J., Tafoya, A., **Lee, W.-Y.**, Varela-Ramirez, A., Peralta-Videa, J.R., Gardea-Torresdey, J.L., "Cerium Oxide Nanoparticles Modify The Antioxidative Stress Enzyme Activities And Macromolecule Composition In Rice Seedlings", *Environ. Sci. Technol.*, 2013, 47 (24), 14110-14118, DOI: 10.1021/es4033887.
 - b. Rico, C., Morales, M., Barrios, A., McCreary, R., Jong, J., **Lee, W.-Y.**, Nunez, J., Peralta-Videa, J.R., Gardea-Torresdey, J.L., "Effect of Cerium Oxide Nanoparticles on the Quality of Rice (*Oryza sativa* L.) Grains" *J. Agric. Food Chem.*, 2013, 61 (47), 11278–11285, DOI:10.1021/jf404046v.
 - c. Lauer, F.T., Mitchell, L.A., Bedrick, E., McDonald, J.D., **Lee, W.-Y.**, Li, W.W.,

Olivera, H., Amaya, M.A., Berwick, M., Gonzales, M., Currey, R., Pingitore, N.E., and Burchiel, S.W. "Temporal-Spatial Analysis of U.S.- Mexico Border Environmental Fine and Coarse PM Air Sample Extract Activity in Human Bronchial Epithelial Cells", *Toxicology and Applied Pharmacology*, 2009, 238(1), 1-10.

- d. Carlo-Rojas, Z. (Graduate Student); **Lee, W.-Y.**, "Cu and Zn Uptake Inhibition by PAHs as Primary Toxicity in Plants", *Proceedings of the 2007 National Conference on Environmental Science & Technology*, 2009, Springer Science+ Business Media, 41-46.

D. Research Support

On-going Research

- 06/01/2017 to 05/30/2022, Role: co-PI (PI, Renate Aguilera) NIH #R25GM069621-11
Project Title: RISE Option IV: Research Scholars Program
Goals: The primary objective of the RISE Scholars Program at the University of Texas at El Paso (UTEP) is to increase the participation of disadvantaged underrepresented minority students (URM) in biomedical research. The specific aims of this program are as follows: (1) To provide increased access to educational and research biomedical training activities for URM students; (2) Increase the number of URM undergraduates who choose to pursue careers in biomedical research; and (3) Increase the representation of URM graduate students in the Biology and Chemistry Ph.D. programs to a level equivalent to our URM undergraduate population.

Completed Research Support

- 05/25/2012 to 03/31/2017, Role: co-PI (PI, Renate Aguilera) NIH
Project Title: RISE Option III: Research Scholars Program
Goals: The primary objective of the RISE Scholars Program at the University of Texas at El Paso (UTEP) is to increase the participation of disadvantaged underrepresented students (UR) in biomedical research.
- 10/01/2013 to 09/30/2017, Role: co-PI (from 2013 to 2015) (PI, Pei-Ling Hsu) NSF
Project Title: Transforming Students' Partnership with Scientists Through Cogenerative Dialogues
Goals: This research project is to use the educational innovation of cogenerative dialogues (cogens) to transform high school students' partnerships with scientists. Working with scientists has been suggested as a powerful activity that can stimulate students' interest in science and help them experience science practice. The proposed project will take cogens from formal (urban) schooling into informal science education to investigate their impact on communication between high school students and scientists.