Leslie M. Shor, Ph.D.

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CURRENT POSITION

2009-present Assistant Professor, Department of Chemical & Biomolecular Engineering
Center Faculty, Center for Environmental Science & Engineering
Graduate Faculty, Environmental Engineering Program
Affiliated Faculty, Institute of Materials Science

Research Interests and Expertise

Environmental Biotechnology: "Engineered Microbial Habitats"

- Development of synthetic systems to emulate micro-structured microbial habitats. Features include appropriately-scaled physical features and dynamically-controlled chemical gradients (i.e., antimicrobials, nutrients, and/or oxygen).
- Micro-scale analysis of biological responses to local microenvironment conditions using optical and electrochemical sensors, wide-field and confocal microscopy, and digital image processing.
- Microfabrication techniques including photolithography, soft lithography and advanced manufacturing (i.e., 3D printing) for creation of microfluidic masters and devices.
- Manipulation of cells using flow, droplets, contact printing, and photopatterning,
- Integration of modeling and experiments using microbes, particles, and solutes using a variety of approaches including finite element simulations and agent-based modeling.
- Applications include sustainable food and fuel production, protection of environmental quality, improved prediction of environmental processes and feedbacks, and development of therapies to improve human health.
- Keywords: Microfluidic. Pore-scale Processes. Biofilm. Protist.

Contaminant Fate & Transport. Fate and transport of hydrophobic organic contaminants, especially PAHs, spanning micro-scale interfacial processes to regional modeling. Bioavailability. Risk Assessment.

EDUCATION

2002 Ph.D. Chemical and Biochemical Engineering, Rutgers University, New Brunswick NJ.

1999 M.S. Chemical and Biochemical Engineering, Rutgers University, New Brunswick NJ

1996 B.A. *with high distinction*, Chemistry and Environmental Sciences (double major), University of Virginia

FUNDING (*Total competitive awards to the Shor Lab: >$1.5M)*

Foundation Award

2012-2014 "Structuring the Rhizosphere: Using Protozoa to Sow Bacteria." Role: PI (Co-PI D. Gage). **Bill & Melinda Gates Foundation**, Global Development Program. $100,000.

Industry Awards

2014 "Development of Scalable Droplet Microfluidic Devices." Role: PI. **BASF**. $35,000.

2014-2017 "Spatially-Structured Rhizosphere Scaffolds for Crop Root Support." **DuPont Young Professor Award**. $75,000

2006-2008 "Leachate test methods for the evaluation of the effectiveness of in-situ stabilization of soil material at former MGP sites." Role: Co-PI. (PI: A Garrabrants, Co-PI David S. Kosson.) Electric Power Research Institute (**EPRI**). $166,250.

Federal Awards

2011-2016 "EFRI: Innovations for Next Generation Biomanufacturing and Microengineering." Role: Co-PI. (PI: R Srivastava; Co-PIs: D. Gage, J. Graf, W. Mustain). **NSF**, Emerging Frontiers in Research and Innovation. $2,000,000 (Shor Lab portion: $410,000).

2012-2015 "ASCCEND: Addressing Social Challenges through Creativity Engineering, Nanotechnology, and Diversity." Role: PI (Co-PIs: A. Agrios, B. Huey, N. Madjar, H. Silva). **NSF**, Nanotechnology Undergraduate Education (NUE) Program. $200,000.

2012-2015 "Pore Scale Effects of Soil Structure and Microbial Interactions on Soil Water Retention." Role: PI (Co-PI: D. Gage). **USDA**, National Institute for Food and Agriculture. $150,000.

2012-2015 "Microfluidic studies of signaling between rhizosphere bacteria and their predators." Role: Co-PI (PI: D Gage). **USDA**, National Institute for Food and Agriculture. $150,000.

2014 "Targeted Nanoparticles for Kidney Cancer Therapy." Role: Sub-awardee (PI S. Torti). **DOD** USAMRAA. $34,373.

2010-2014 "EAGER: Field-deployed Microfluidic Trap Array for Discovery and Observation of Microbial Eukaryotes." Role: PI. **NSF**, Division of Biological Infrastructure, Instrument Development for Biological Research (IDBR) program. $160,000.

2007-2010 "EcoChip: A Micro-structured Microbial Habitat Array." Role: PI. **NSF**, Division of Biological Infrastructure, Instrument Development for Biological Research (IDBR) program. $400,000.

2007-2010 "REU EcoChip: Research Experiences Creating A Micro-structured Microbial Habitat Array." Role: PI. **NSF**, Division of Biological Infrastructure, Instrument Development for Biological Research (IDBR) program. $30,000.

Internal Awards

2014 "Protist Information Cascades." Role: Mentor. UConn Summer Undergraduate Research Fund (SURF) fellowship to Paige Orlofsky. $4,000.

2013 "Facilitated Transport of Soil Bacteria by Protists." Role: Mentor. UConn Summer Undergraduate Research Fund (SURF) fellowship to Virginia Cousens. $4,000.

2012 "Design a Microfluidic Protozoa Separator for Genetic Analysis of Microbial Eukaryotes in Termite Guts." Role: Mentor. UConn Summer Undergraduate Research Fund (SURF) fellowship to Erika Orner. $4,000.

2012 "A Method for Observing the Development of Biofilms on Water Purification Membranes in Real Time." Role: Mentor. UConn Summer Undergraduate Research Fund (SURF) fellowship to Jacob Deneff. $4,000.

2011-2012 "Innovations in Emerging Frontiers: Stroboscopy for 3-D Rheology of Bio-Engineering Solutions (STROBES)." Role: Co-PI (PI B Huey). UConn School of Engineering. $30,000.

2011 "High-Throughput Assay to Measure Innate and Induced Antibiotic Resistance in Biofilms," Role: PI. UConn Large Faculty Grant. $24,000.

2011 "Pore Scale Effects of Soil Structure and Microbial Interactions on Soil Water Retention," Role: PI. UConn Center for Environmental Science & Engineering, Graduate Student Research Assistantship Program. $11,500.

2010 "A Microfluidic Infection Thread Assay to Study Initiation of Symbiotic Nitrogen Fixation," Role: PI. UConn Center for Environmental Science & Engineering, Graduate Student Research Assistantship Program. $11,350.

2012 "Determining the Effect of Spacing in Protection of Staphylococcus aureus by Pseudomonas Aeruginosa." Role: Mentor. UConn Summer Undergraduate Research Fund (SURF) fellowship to Leonela Villegas. $4,000.

SCHOLARSHIP *Google Scholar: LM Shor. Total Google Scholar Citations: 393. H-Factor = 8.*

Patents and Intellectual Property

Gage, D, LM Shor, J Gage, RL Rubinstein*. "Microbial Carriers for Targeted Delivery of Agricultural Payloads." Provisional US Patent, filed September 17, 2013. MBHB 13-1101-PCT : UConn 13-006.

Shor, LM, AC Garrabrants, DS Kosson. "Device for Leaching Extraction and Assessment" US. Patent No. 7,930,948, Issued Apr 26, 2011.

Peer Reviewed Journal Articles

Rubinstein*, RL, AL Kadilak*, VC Cousens**, DJ Gage, LM Shor. 2015. Protist-facilitated particle transport using emulated soil micromodels. *Environmental Science & Technology.* 49(3), 1384–1391.

Deng*, J, EP Orner**, JF Chau, EM Anderson**, AL Kadilak*, RL Rubinstein*, GM Bouchillon*, R Goodwin, DJ Gage, LM Shor. 2015. Pore-scale determination of microbially-mediated drying resistance using emulated soil micromodels. *Soil Biology & Biochemistry*. 83(4), 116–124.

Bouchillon*, GM, JF Chau, G. B. McManus, LM Shor. 2014. Microfluidic passive samplers for concentration and isolation of live protists. *Analytical Methods*. 6 (20), 8350-8357.

Kadilak*, AL, Y. Liu, S Shrestha, JR Bernard**, WE Mustain, LM Shor. 2014. Selective deposition of chemically-bonded gold electrodes onto PDMS microchannel side walls. *J. Electroanalytical Chemistry*. 727, 141-147.

Schröfel, A, G Kratošová, I Šafařík, M Šafaříková, I Raška, LM Shor. 2014. Applications of biogenic metallic nanoparticles – a review." *Acta Biomaterialia.* 10 (10), 4023-4042

J Deng*, A Dhummakupt**, PC Samson, JP Wikswo, LM Shor. 2013. "Dynamic dosing assay relating real-time respiration responses of Staphylococcus aureus biofilms to changing micro-chemical conditions." *Analytical Chemistry*. 85 (11), 5411–19.

Markov DA, PC Samson, DK Schaffer, A Dhummakupt**, JP Wikswo, LM Shor. 2010. Window on a microworld: Simple microfluidics for studying microbial transport in porous media. *Journal of Visualized Experiments* (JoVE) 39.

Markov, DA, S Manuel, LM Shor, S Opalenik, JP Wikswo, P Samson. 2010. Tape-underlayment, rotary-node (TURN) valves for simple on-chip microfluidic flow control. *Biomedical Microdevices* 12(1),135-44.

Rodenburg, LA, SN Valle, MA Panero, GR Muñoz, LM Shor. 2010. Mass balances on selected polycyclic aromatic hydrocarbons (PAHs) in the NY/NJ Harbor. *Journal of Environmental Quality* 39,642-653.

Wang, W, LM Shor, EJ LeBoeuf, JP Wikswo, GL. Taghon, DS Kosson. 2008. Protozoa migration in bent microfluidic channels. *Applied and Environmental Microbiology* 74(6), 1945-1949.

Wang, W, LM Shor, EJ LeBoeuf, JP Wikswo, DS Kosson. 2005. Mobility of protozoa through narrow channels. *Applied and Environmental Microbiology* 71(8), 4628-4637.

Shor, LM, KJ Rockne, LY Young, GL Taghon, DS Kosson. 2004. Combined effects of contaminant desorption and toxicity on risk from PAH contaminated sediments. *Risk Analysis: An International Journal* 24(5), 1109-1120.

Shor, LM, W Liang, KJ Rockne, GL Taghon, LY Young, DS Kosson. 2003. Intra-aggregate mass transport-limited bioavailability of polycyclic aromatic hydrocarbons to *Mycobacterium* strain PC01. *Environmental Science & Technology* 37(8), 1545-1552.

Shor, LM, KJ Rockne, LY Young, GL Taghon, DS Kosson. 2003. Desorption kinetics for field-aged polycyclic aromatic hydrocarbons from sediments. *Environmental Science & Technology* 37(8), 1535-1544.

Rockne, KJ, LM Shor, LY Young, GL Taghon, DS Kosson. 2002. Distributed sequestration and release of PAHs in weathered sediment: The role of sediment structure and organic carbon properties. *Environmental Science & Technology* 36(12), 2636-2644.

Book Chapters

Bossert, ID, LM Shor, DS Kosson. 2001. "Methods for measuring hydrocarbon biodegradation in soils," in CJ Hurst, RLCrawford, GR Knudsen, MJ McInerney, and LD Stetzenbach (eds.) Manual of Environmental Microbiology, 2nd Ed. ASM Press, Washington D.C. pp. 934-943.

Shor, LM and DS Kosson. 2000. "Bioavailability of organic contaminants in soils," in JJ Valdes (ed.) Bioremediation. Kluwer Academic Publishers, Dordrecht pp.15-43.

Other Peer-Reviewed Publications

Deng*, J, DJ Gage, LM Shor. "Variations in moisture retention of contact-printed soil bacteria surface colonies using confocal microscopy." 2014 40th Annual Northeast Bioengineering Conference (NEBEC) Proceedings, IEEE Xplore, April 2014, Boston MA, 10.1109/nebec.2014.6972771.

Deneff**, JI, JR McCutcheon, LM Shor. "Method for Direct Observation of Biofilm Formation During Operation on Forward Osmosis Membranes." 2014 40th Annual Northeast Bioengineering Conference (NEBEC) Proceedings, IEEE Xplore, April 2014, Boston MA, 10.1109/nebec.2014.6972772.

Dhummakupt**, A., PC Samson, D Markov, JP Wikswo, LM Shor. "Measuring Oxygen Concentration Under *Staphylococcus aureus* Biofilms in Response to Chemical Gradients in a Microfludic Device." Abstract of the Fourth Annual q-bio Conference on Cellular Information Processing, August 11-14, 2010, Santa Fe, NM.

Garrabrants, AC, LM Shor, DS Kosson, RNJ Comans, A van Zomeren, HA van der Sloot, O Hjelmar, EA Hansen, and A Coleman. 2007. "Leaching Assessment Methods for the Evaluation of the Effectiveness of In-Situ Stabilization of Soil Materials at Manufactured Gas Plant Sites" Electric Power Research Institute (EPRI), Palo Alto, CA. 1014062.

Valle, SN, MA Panero, and LM Shor. 2007. "Pollution prevention and management strategies for polycyclic aromatic hydrocarbons in the New York/New Jersey Harbor." New York Academy of Sciences, Harbor Consortium. New York, N.Y.

Young, LY, W Liang, LM Shor, DS Kosson, KJ Rockne, and GL. Taghon. 2002. "Bioavailability of PAHs to bacteria in estuarine sediment." Soil and Sediment Contamination: An International Journal. 11(3) 488.

Comans, RNJ, G Roskam, A Oosterhoff, LM Shor, M Wahlstrom, J Laine-Ylijoki, M Pihlajaniemi, M Ojala, K Brokholm, K Vilholth, O Hjelmar, P Daly, R Woodhead, J Higgins, T Heimovaara, J Keijzer, H Keijzer. 2001. Development of standard leaching tests for organic pollutants in soils, sediments, and granular waste materials. European Commission, Brussels, Belgium.

Kosson, DS, LM Shor, KJ Rockne, W Liang, GL Taghon, and LY Young. 2000. Mass transfer limitations on bioavailability of PAHs from contaminated estuarine sediments." American Chemical Society, Division of Environmental Chemistry, 85-ENVR, 220(1), U329-U329.

Dissertation

LM Shor. 2002. "Bioavailability of Polycyclic Aromatic Hydrocarbons in Two Estuarine Sediments: Decoupling Biological, Physical and Chemical Processes." Rutgers, The State University of New Jersey. Committee Members DS Kosson (Chair), B Narasimhan, H Pedersen, KJ Rockne, GL Taghon, LY Young.

HONORS and AWARDS

2014-7 DuPont Young Professor

2013 Invited Speaker, National Academy of Engineering, Frontiers of Engineering Education Symposium

2012 Grantee, Bill & Melinda Gates Foundation, Grand Challenges Explorations in Agricultural Development

2012 Finalist, Connecticut Women of Innovation, Academic Innovation and Leadership

2011 Invited Attendee, National Academy of Engineering, Frontiers of Engineering Education Symposium

2009-13 Northeast Utilities Assistant Professor in Environmental Engineering Education, Department of Chemical Engineering, University of Connecticut (term endowed chair)

2007 Vanderbilt SWE Faculty Appreciation Award

1996-9 NIH Biotechnology Training Fellowship (3 yrs)

1996 Hydrology Award, Department of Environmental Sciences, University of Virginia

PRESENTATIONS

Invited Presentations (32 total)

- Rutgers, The State University of New Jersey, Department of Environmental Sciences, New Brunswick NJ, December 12, 2014.
- DuPont Experimental Station, Biologicals Venture, Wilmington DE September 22 2014.
- University of Connecticut, Department of Animal Sciences, Storrs CT February 28, 2014.
- University of California at Davis, Department of Viticulture & Enology, January 27, 2014.
- University of Connecticut, Phi Sigma Rho (women engineering service sorority), Storrs CT, Annual awards banquet (Keynote), November 21, 2013.
- University of Virginia, Department of Chemical Engineering, Charlottesville VA, October 24, 2013.
- ETH Zurich, Department of Environmental Systems Science (D-USYS), Institute of Terrestrial Ecosystems (ITES), Soil and Terrestrial Environmental Physics (STEP), July 15, 2013.
- BASF Corporation, Fine Chemicals & Biocatalysis Division, Tarrytown NY, April 19, 2013.
- University of Rhode Island, Department of Chemical Engineering, Kingstown RI, March 21, 2013.
- Worcester Polytechnic Institute, Department of Chemical Engineering, Worcester MA, January 30, 2013.
- University of Connecticut, Department of Marine Sciences, Groton CT, March 2010.
- University of Connecticut, Environmental Engineering Program, Storrs CT, March 2010.
- Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), Chemical Engineering, Monterrey Mexico, January 2010.
- University of Notre Dame, Dept of Civil Engineering and Geological Science, South Bend ID, March 2009.
- Ohio State University, Dept of Civil and Environmental Engineering, Columbus OH, March 2009.
- University of Wyoming, Dept of Chemical and Petroleum Engineering, Laramie WY, February 2009
- Temple University, Dept of Civil & Environmental Engineering, Philadelphia PA, February 2009.
- Villanova University, Dept of Civil & Environmental Engineering, Philadelphia PA, February 2009.
- University of Massachusetts Amherst, Dept of Chemical Engineering, Amherst MA, February 2009.
- University of Texas at Arlington, Dept of Civil Engineering, Arlington TX, February 2009.
- University of Connecticut, Dept of Chemical & Biomolecular Engineering, Storrs CT, January 2009.
- West Virginia University, Dept of Chemical Engineering, Morgantown WV, January 2009.
- Colorado State University, Dept of Civil and Environmental Engineering, Ft Collins CO, December 2008.
- NSF Workshop, Critical Needs in Instrument Development for Biological Research, Arlington VA, September 2008.
- Rutgers University, Dept of Civil & Environmental Engineering, August 2008.
- Society of Women Engineers (SWE) National Conference, Women in Academic Careers panel, Nashville TN, October 2007.
- New York Academy of Sciences (NYAS) Harbor Consortium, New York NY June 2007.
- New York Academy of Sciences (NYAS) Harbor Consortium, New York NY December 2006.
- New York Academy of Sciences (NYAS) Harbor Consortium, New York NY April 2006.
- New York Academy of Sciences (NYAS) Harbor Consortium, New York NY November 2005.
- New York Academy of Sciences (NYAS) Harbor Consortium, New York NY June 2005.

Selected Oral Presentations *(Given by LM Shor)*

Shor, AL Kadilak*, WE Mustain. "Design, fabrication, and performance of synthetic microbial habitat systems." American Chemical Society (ACS) 247th National Meeting, March 16-20 2014, Dallas TX.

Shor, LM, J Deng*, E Orner**, EM Anderson**, D Gage. "Pore Scale Effects of Microbial Extracellular Matrix Production on Soil Water Retention." USDA Principal Investigators Meeting, June 20 2013, Annapolis MD.

Shor, LM. "Window on a Microworld: Microfabricated Arrays with Control of the Microenvironment." UConn-Jackson Labs Research Symposium, September 6-7 2012, Storrs CT.

Shor, LM. GM Bouchillon*, A Dhummakupt**, JF Chau. "Spatial and Temporal Patterns of Protozoa Migration within Micro-structured Landscapes." General Meeting of the American Society for Microbiology (ASM), May 21-24 2011, New Orleans LA. (Selected for "**Young Investigator**" presentation.)

Shor, LM 2009. "Towards Predicting Impacts of Nanomaterials in the Environment." American Institute of Chemical Engineers (AIChE) National Meeting. Nashville TN.

*Denotes graduate student advisee

**Denotes undergraduate student advisee

Shor, LM Rodenburg, LA, SN Valle, MA Panero, GR Muñoz. 2009. "Challenges to Water Quality Sustainability From Chronic PAH Pollution in An Urban Estuary." AIChE National meeting, Nashville TN.

Shor, LM, Y Li, PC Samson, DA Markov, EJ LeBoeuf. "Microbial Transport in Porous Media Using Microfluidc Flow Cell Arrays." 1st International Conference on Microbial Transport and Survival in Porous Media, May 2009, Niagra-on-the-Lake, ON.

Shor, LM "Screening Impacts of Nanomaterials in the Environment." American Institute of Chemical Engineers (AIChE) Spring Meeting, April 2009, Tampa FL.

Shor, LM, Vanessa Allwardt**, and P. Samson. "Microfluidic Devices as Micro-structured Microbial Habitat Arrays." American Society for Microbiology (ASM) KY-TN Meeting, October 2008, Henderson TN.

Shor, LM, W. Wang, EJ LeBoeuf, and DS Kosson, "Mobility of Protozoa through Narrow Channels." 7th Biennial Symposium of the International Society of Environmental Biotechnology, June 2004, Chicago IL.

Shor, LM, DS Kosson, KJ Rockne, LY Young, GL Taghon, "Synergistic Effects of Contaminant Desorption and Toxicity: Implications for Environmental Risk Assessment." Society for Risk Analysis (SRA) Annual Meeting, December 2002, New Orleans LA.

Shor, LM, KJ Rockne, DS Kosson, S Erdal, "Assessment of Cancer Risks for Recreational Populations Exposed to PAH-Contaminated Sediments and Biota in the New York/New Jersey Harbor Estuary: A Probabilistic Approach." Society for Risk Analysis (SRA) Annual Meeting, December 2000, Arlington VA.

Shor, LM, KJ Rockne, W Liang, GL Taghon, DS Kosson, LY Young, "Mass Transfer Limited Biodegradation and Long-Term Release of PAHs from Contaminated Sediments." Society of Environmental Toxicology and Chemistry (SETAC) 21st Annual Meeting, November 2000, Nashville TN.

Shor, LM, KJ Rockne, W. Liang, DS Kosson, LY Young, GL. Taghon, "Factors Controlling Desorption and Bioavailability of PAHs in Size- and Density-Fractionated Field-Aged Contaminated Estuarine Sediments." 17th Annual International Conference on Contaminated Soils, Sediments and Water, October 2000, Amherst MA.

Selected Presentations *(Oral Presentations and posters given by co-authors, 2008-present)*

Kadilak, AL, Y Liu, WE Mustain and LM Shor. "In Situ Oxygen Gradient Generation and Control inside a Microfluidic Habitat." AIChE Annual Meeting, November 16-21, 2014, Atlanta GA.

Ward, M., D. Evans**, E. Carboni*, GM Bouchillon*, LM Shor, S Torti and AWK Ma. "A Microfluidic Study of Nanoparticles in Simulated Blood Flows: Understanding the Effect of Margination." 2014 AIChE Northeast Student Regional Conference, April 4-5 2014, Storrs CT.

Deng*, J. and LM Shor. "Microfluidic dosing assay to determine inhibition of *Staphylococcus aureus* biofilms by daptomycin." American Chemical Society (ACS) 247th National Meeting, March 16-20 2014, Dallas TX.

Orner**, E,** EM Anderson**,** RL Rubinstein*, JF Chau, LM Shor, DJ Gage. "Pore-Scale Effects of Soil Structure and Microbial EPS Production On Soil Water Retention." AGU Fall Meeting, December 9-13 2013, San Francisco CA. (**Travel Award Recipient.**)

Rubinstein*, RL, V Cousens**, DJ Gage, LM Shor. "Protist-facilitated transport of soil bacteria in an artificial soil micromodel." AGU Fall Meeting, December 9-13 2013, San Francisco CA. (**Travel Award Recipient.**)

Carboni*, M., GM Bouchillon*, LM Shor, S Torti and AWK Ma. "A Microfluidic Study of Nanoparticles in Simulated Blood Flows: Understanding the Effect of Margination MRS Fall Meeting, December 1-6, 2013, Boston MA.

Sullivan, M, V Patel, M Ward, D Evans, E Carboni*, GM Bouchillon*, LM Shor, S Torti and AWK Ma. "Understanding the Flow Dynamics of Nanoparticles for Improved Cancer Therapy." AIChE Annual Meeting, November 4-7, 2013, San Francisco CA.

Orner**, E**, RL Rubinstein*, JF Chau, DJ Gage, LM Shor. "Pore-Scale Effects of Soil Structure And Microbial EPS Production On Soil Water Retention." 48th Annual Region I Meeting of the American Society for Microbiology, October 25-26 2013, Storrs CT.

Rubinstein*, RL, V Cousens**, DJ Gage, LM Shor. "Protist-facilitated transport of soil bacteria in an artificial soil micromodel." 48th Annual Region I Meeting of the American Society for Microbiology, October 25-26 2013, Storrs CT.

Deng*, J, J Deneff**, LM Shor. "Advanced Methods for Characterizing Biofilms and Biofouling of Surfaces." 48th Annual Region I Meeting of the American Society for Microbiology, October 25-26 2013, Storrs CT.

Gage, JL, RL Rubinstein*, J Micciulla*, DJ Gage, LM Shor. "Structuring the Rhizosphere: Using Protozoa to Sow Bacteria for Sustainable Crop Production." Bill & Melinda Gates Foundation, Agriculture programs grantees meeting, March 13-15 2013, Seattle WA.

Carboni*, E, GM Bouchillon*, LM Shor, A Ma. "A Microfluidic Study of Nanoparticles in Simulated Blood Flows: Understanding the Effect of Margination." Annual Meeting of The Society of Rheology, February 10-14, 2013, Pasadena, CA.

Deng*, J, and LM Shor. "High Throughput Screening the Effects of Antibiotic Delivery Rates On Biofilm Antibiotic Resistance." American Institute for Chemical Engineers (AIChE) Annual Meeting, October 28th - November 2nd, 2012, Pittsburgh, PA

Kadilak*, AL, A Card,** T Kelly,** LM Shor. "Hydrogel-filled capillaries as in-plane barriers in microfluidic devices." American Institute for Chemical Engineers (AIChE) Annual Meeting, October 28th - November 2nd, 2012, Pittsburgh, PA.

Anderson**, EA,** AL Kadilak*, JF Chau, R. Goodwin*, DJ Gage, and LM Shor. "Impact of Hydrogel Content on Water Retention in Soil Micromodels." American Institute for Chemical Engineers (AIChE) Annual Meeting, October 28th - November 2nd, 2012, Pittsburgh, PA. (1st Place Poster, Environmental Division.)

Schröfel, A and LM Shor. "Biosynthesis of noble metal nanoparticles by diatoms and their catalytic and antimicrobial properties." American Chemical Society (ACS) 244th National Meeting, August 19-23, 2012, Philadelphia, PA.

Deng*, J and LM Shor. "Time-dependent emergence of penicillin resistance in Staphylococcus aureus biofilms." American Chemical Society (ACS) 244th National Meeting, August 19-23, 2012, Philadelphia, PA.

Kadilak*, AL, EM Anderson**, JF Chau, LM Shor." Pore-scale effects of microbial hydrogels on soil water retention." American Chemical Society (ACS) 244th National Meeting, August 19-23, 2012, Philadelphia, PA.

Kadilak*, AL, A Card**, T Kelly**, LM Shor. "Hydrogel-filled capillaries as in-plane barriers in microfluidic devices." American Chemical Society (ACS) 244th National Meeting, August 19-23, 2012, Philadelphia, PA.

Gage, D, LM Shor, R Goodwin*, M Jain. "Microfluidic studies of signaling between rhizosphere bacteria and their predators." USDA Principals Meeting, July 26 2012.

Srivastava, R, D Gage, LM Shor, J Graf, WE Mustain. "Creation and Manipulation of an Artificial Termite Gut Through Control Of The Microenvironment." NSF EFRI Principals Meeting, Washington DC March 1 2012.

Horrell*, N, J Bushey, LM Shor. "Chloride from Road Salt: Impacts to Microbial Community Structure and the Implications for Regional Nitrogen Budgets." SETAC North America 32nd Annual Meeting, November 13-17 2011, Long Beach CA.

Chau, JF, GM Bouchillon*, LM Shor. "Microfluidic Trap Arrays to Study Protozoan Biogeography in Natural and Engineered Habitats" American Society for Microbiology (ASM) 46th Annual Region I Meeting, October 26-27, 2011, Randolph MA.

Villegas, L**, J Deng*, LM Shor. "Determining the Effect of Spacing in Protection of Staphylococcus aureus by Pseudomonas aeruginosa." American Institute of Chemical Engineers (AIChE). October 16-21, 2011, Minneapolis MN. (**1st Place**, Food Pharmaceuticals & Bioengineering Division).

Kadilak*, AL, E Anderson** and LM Shor. "Pore Scale Effects of Soil Structure and Microbial Hydrogels on Soil Water Retention." American Institute of Chemical Engineers (AIChE). October 16-21 2011, Minneapolis MN. (2nd Place, Student Competition, Environmental Graduate Division).

Deng*, J, A Dhummakupt**, PC Samson, JP Wikswo, LM Shor. "Microfluidic assay relating antimicrobial resistance of *Staphyloccus aureus* biofilms to changing micro-chemical conditions." American Institute of Chemical Engineers (AIChE). October 16-21 2011, Minneapolis MN.

Chau, JF, GM Bouchillon*, LM Shor. "Linking Form, Function, and Molecular Taxonomy: Microfluidic Trap Arrays to Study Protozoan Biogeography." General Meeting of the American Society for Microbiology (ASM), May 21-24 2011, New Orleans LA. (JF Chau selected for "**Young Investigator**" oral presentation.)

Chau, JF, GM Bouchillon*, LM Shor. "Microbial trap array for in situ determination of natural carbon cycling." American Chemical Society (ACS) National Meeting, Anaheim CA March 27-31 2011.

Shor, LM "Micro-structured Microbial Habitats." Microenvironments Modulating Biological Interactions in the Ocean Symposium, January 16-21, 2011, Aspen CO.

Chau, JF, GM Bouchillon*, LM Shor. "Linking Form, Function, and Molecular Taxonomy: Microfluidic Trap Arrays for Microbial Eukaryotes." The 8th Annual Ecological Genomics Symposium, November 5 - 7, 2010, Kansas City MO

Dhummakupt**, A**, PC Samson, DA Markov, JP Wikswo, LM Shor. Measuring Oxygen Concentration Under Staphylococcus aureus Biofilms in Response to Chemical Gradients in a Microfludic Device, in Biomedical Engineering Society (BMES) Annual Meeting, October 2010, Austin, TX.

Markov, DA, PC Samson, DK Schaffer, A Dhummakupt**, JP Wikswo, LM Shor. Window into a Microworld: microfluidic system for studying microbial growth in porous media, in Biomedical Engineering Society (BMES) Annual Meeting, October 2010, Austin, TX.

Shaw, M., Shor, L., McCutcheon, J.R., Subramanian, C., Anastasio, D. "Rheological Examination of Sodium Alginate Gelation", Poster Presentation at the Society of Rheology Annual Meeting, October 24-28, 2010, Santa Fe, NM.

McNew, CP, EJ LeBoeuf, Y Li, LM Shor, DA Markov. "Examination of NOM Physicochemical Properties on Nanomaterial Transport." American Chemical Society (ACS) March 2010, San Francisco CA.

Greene, JL,** LM Shor. "Sorption and Diffusion of Antibacterial Compounds into PDMS." American Institute of Chemical Engineers (AIChE). November 2009, Nashville TN (3rd Place, Student Competition, Materials Division).

Dhummakupt**, A,** JL Greene,** PC Samson, JP Wikswo, LM Shor. "Creating Patterned Biofilms of Staphylococcus aureus for Use in an Oxygen-Sensing Microfluidic Device." American Institute of Chemical Engineers (AIChE). November 2009, Nashville TN.

Dhummakupt**, A,** JL Greene,** PC Samson, JP Wikswo, LM Shor. "Creating Patterned Biofilms of Staphylococcus aureus for Use in an Oxygen-Sensing Microfluidic Device." Biomedical Engineering Society (BMES) Annual Meeting. October 2009, Pittsburgh, PA.

Tuorto, SJ, GL Taghon, LM Shor. "Demonstrating Spatial and Conditional Resource Differentiation by Marine Bacterivorous Protozoa Using Simulated Microhabitats." 109th General Meeting of the American Society for Microbiology (ASM). May 2009, Philadelphia PA.

Greene, JL**, LM Shor. "Diffusion and Partitioning of Organic Compounds into Polydimethyl Siloxane (PDMS)." Tennessee Academy of Sciences. March 2009, Nashville TN (1st Place, Student Competition, Chemistry Division).

Dhummakupt**, A,** LM Shor. "Information Cascades in a Protozoan Population Caused by Sequential Choices of Individuals." Tennessee Academy of Sciences. March 2009, Nashville TN (2nd Place, Student Competition, Biology Division).

Allwardt, V **, P Samson, DA Markov, JW Dolan, JP Wikswo, LM Shor. "Microfluidic Approach to Measure Bacterial Responses to Micro-chemical Gradients." American Society for Microbiology (ASM) KY-TN Meeting, October 2008, Henderson TN (Winner: best student paper).

Shor, LM, W Wang, GL Taghon, JP Wikswo, EJ LeBoeuf, DS Kosson. "Protozoan Predation Behavior in Microfluidic Habitat Networks." 108th General Meeting of the American Society of Microbiology, June 2008, Boston, MA.

TEACHING & LEARNING

Curriculum Development

Creator: Innovation & Creativity in Engineering, and interdisciplinary engineering program.
Goals: (i) train undergraduates to better employ creative thinking, management skills, and an ability to evaluate social outcomes of engineering; (ii) increase participation of under-represented groups in STEM.

Constituent Courses:

- Nanoscience & Society (3 credits) (Instructor: B. Huey or H. Silva)
- Managing Creativity & Innovation (3 credits) (Instructor: N. Madjar)
- Interdisciplinary Capstone Design (1 credit) (Instructors: LM Shor & A. Agrios)

Courses Developed & Instructed - University of Connecticut

1. **Fluid Mechanics (CHEG 3123 with Honors section)** **(Existing Course Modified)**
Junior-level core course, Chemical Engineering Program, 3 credits.
   - Adapted the existing "Transport Phenomena I" course into a more rigorous, dedicated single-semester Fluid Mechanics. Content includes mass, energy, and momentum balances from differential and integral approaches; fluid flow phenomena; theoretical and empirical relationships for design of incompressible fluid-flow systems.
   - New content includes hands-on demonstrations and instruction in the engineering simulation software "COMSOL Multiphysics" for analysis and visualization of fluid flow phenomena.
   - Developed a unique Honors Project each year, and incorporated a new module on ethics.

   Transport Phenomena I (CHEG 3123 with Honors section)
   Junior-level core course, Chemical Engineering Program, 3 credits.
   - Overall mass, energy, and momentum balances; fluid flow phenomena; theoretical and empirical relationships for design of incompressible fluid-flow systems; conductive heat transfer; heat transfer coefficients and design of heat exchange systems.
     - Developed the honors project assignment, "Informing public policy using engineering principles."

2. **Capstone Design II (CHEG 4143 with Honors section)** **(New Course Developed)**
Senior-level core course, Chemical Engineering Program, 3 credits.
   - Created a new 2-semester Capstone Design sequence from the existing 1-semester Process Design course.
   - Developed new learning outcomes aligned with program goals and ABET requirements. Delineated required elements of Capstone Design projects for faculty and industry-sponsored projects. Authored detailed descriptions of course deliverables and evaluation rubrics.
   - Course deliverables included weekly reports and Gantt charts, interim and final presentations, final written report, final poster, and individual reflection.
   - In the first year, four projects were sponsored by industry. Departmental Industrial Advisory Board indicated there was a "Step Change" in the quality of Capstone Design projects.

3. **Interdisciplinary Senior Design (ENGR 3195)** **(New Course Developed)**
Senior-level elective, School of Engineering, 1 credit.
   - Constituent course of the "Innovation & Creativity in Engineering" program designed to enhance the existing Capstone Design courses already offered by all departments in the School of Engineering at UConn.
   - Interdisciplinary groups were mentored in a range of tasks designed to enhance their understanding of the broader societal implications of their design projects including alternative socio-economic or geopolitical frameworks, as well as how to integrate individual contributions of into effective interdisciplinary teams.
   - Semester taught:

4. **Engineered Microhabitats Seminar (CHEG 5395)** **(New Course Developed)**
Graduate-level elective, Chemical Engineering Program, 2 credits.
   - Seminar for advanced researchers in microfluidics and bioMEMS emphasizing biological applications including controlled cellular habitats and organ-on-a-chip applications.

*Denotes graduate student advisee
**Denotes undergraduate student advisee

5. **Principles and Applications of Microfluidic Devices (New Course Developed)**
(CHEG 5394 & 4995, BME 4985 & 6086)
Graduate-level elective, Chemical Engineering programs, 3 credits.
Developed new course to highlight the power of miniaturization to understand, mimic and control fundamental chemical and biological processes. Course content includes
   - Classroom instruction on techniques, theory, and application.
   - Hands-on laboratory instruction in fabrication and computer simulation with COMSOL Multiphysics.
   - Student groups completed individual semester-long microfluidic device design projects.

6. **Introduction to Chemical Engineering (CHEG 2103 with Honors section) (Existing Course)**
Sophomore-level core course, Chemical Engineering Program, 3 credits.
   - Fundamentals of mass and energy balances and thermodynamic and kinetic principles.

Courses Developed & Instructed - Vanderbilt University

2001, 2002, 2007	Fluid Mechanics Core Engineering Course, Junior Level, Departments of Civil & Environmental Engineering and Mechanical Engineering
2007	Fluid Mechanics Laboratory, Fall 2007
2006-2008	Vanderbilt Visions (Full-year Freshman Orientation Course

STUDENT MENTORING

UNIVERSITY OF CONNECTICUT

Research Advising Summary

- 2 post-doctoral scholars
- 4 PhD Students
- 2 MS Students
- 23 Undergraduate Researchers (78% under-represented)

Post-doctoral Research Associates (as major advisor)

2010-2011	Jessica Chau (18 months, part-time). Subsequent employment: Assistant Professor, Benedict College, Columbia SC.
2011-2012	Adam Schröfel, Fulbright Scholar (8 months). Subsequent Employment: The Institute of Cellular Biology and Pathology, Charles University, Prague Czech Republic.

Graduate Students – PhD (as major advisor)

2009-pres	Jinzi Deng, Chemical Engineering (expected graduation, August 2014)
2010-pres	Grant M. Bouchillon, Environmental Engineering (expected graduation, Spring 2015)
2010-pres	Andrea M. Kadilak, Chemical Engineering (expected graduation, Spring 2015)
2014-pres	Brian C. Cruz, Environmental Engineering

Graduate Students – PhD (as committee member)

2010-2014	Kevin Huang, Polymers program. (Major Advisor: Doug Adamson.)
2010-pres	Jason Arena, Chemical Engineering. (Major Advisor: Jeffrey McCutcheon.)
2010-2014	Joseph Parisi, Chemical Engineering. (Major Advisor: Yu Lei.)
2009-pres	Liwei Huang, Chemical Engineering. (Major Advisor: Jeffrey McCutcheon.)
2009-pres	Seetha Manickam, Chemical Engineering. (Major Advisor: Jeffrey McCutcheon.)
2012	Yanfang Fan, Chemical Engineering. (Major Advisor: Christopher Cornelius.)

Graduate Students – MS (as major advisor)

2012-2014	Rebecca L. Rubinstein, Environmental Engineering. “Protist Facilitated Transport in an Artificial Soil Micromodel.”
2009-2010	Robert Yau, Chemical Engineering. “Characterization of Naturally-derived Hydrogels for Microfluidics and Environmental Management”

Graduate Students – MS (as committee member)

2011-2013	Brendan O'Grady , Chemical Engineering. "(Polyethersulfone (PES) and Sulfonated Polyethersulfone (SPES) based thin film composite (TFC) membranes for Osmotic Separations." Major Advisor: Jeffrey McCutcheon.)
2010-2012	Mark Williams, Chemical Engineering. (Major Advisor: William Mustain.)
2010-2012	Michael Podany, Environmental Engineering. (Major Advisor: Jeffrey McCutcheon.)
2010-2012	Yasemin Kutes, Materials Science & Engineering. (Major Advisor: Bryan Huey
2009-2011	Neha Ghaisas, MS Environmental Engineering. "Understanding Formation and Transport of Amorphous Iron Oxyhydroxides in Porous Media using Microfluidic Flow Cells- a Novel Method to Study Freshwater Iron Cycling." Major Advisor: Allision MacKay.
2008-2010	Geeta Dahal, Environmental Engineering. (Major Advisor: Maria Chrysochoou.)
2009-2010	Michael Stredney, Polymers program. (Major Advisor: Doug Adamson.)

Undergraduate Students - University Honors Scholars

2013-pres	Stephanie Knowlton, Biomedical Engineering, in progress. (co-advisor)
2010-2011	Britta Kunkenmoeller, Chemical Engineering, "Engineering" Students: A Study of Engineering Culture at the University of Connecticut" (University Honors Thesis, Spring 2011) (co-advisor)

Undergraduate Students - Honors Scholars

2014-pres	Katherine Alling, Chemical Engineering, in progress.
2014-pres	Jine Woo, Chemical Engineering, in progress.
2014-pres	Elise Gilcher, Chemical Engineering, in progress.
2014-pres	Victoria Drake, Chemical Engineering, in progress.
2013-pres	Paige Orlofsky, Chemical Engineering, in progress.
2013-pres	Jessica Rehaag, Chemical Engineering, in progress.
2011-2014	Jacob Deneff, Chemical Engineering, "Linking membrane performance with biofilm formation." (Honors Thesis, May 2014)
2013-2014	Virginia Cousens, Chemical Engineering, "Protist-facilitated Transport of Bacteria in a Biofilm" (Honors Thesis, May 2014)
2011-2013	Erika Orner, Pathobiology and Veterinary Sciences, "Pore-Scale Effects of Microbial EPS Production on Water Retention in Soil Micromodels" (Honors Thesis, August 2013)
2010-2012	Emily Anderson, Chemical Engineering, "Pore Scale Effects of Bacterial Interactions and Soil Structure on Water Retention in Porous Media" (Honors Thesis, August 2012)

Undergraduate Students – Non-thesis

2014-pres	Frederick Bretherton, Chemical Engineering, in progress.
2014-pres	Alyson Tacchi, Chemical Engineering, in progress.
2014-pres	Mitchell Cyr, Chemical Engineering, in progress.
2014	Megan Greiner, Chemical Engineering, iREU with BASF (UMass), "Development of Scalable Microfluidic Devices for Enzyme Encapsulation."
2013-pres	Jacob Lewis, Chemical Engineering, "Pore-scale Effects of Soil Structure on Water Retention."
2013-2015	Haley Kopp, "Rapid prototyping with 3D printed microfluidic devices."
2013-2014	Joshua Giambra, Chemical Engineering, "Gradient formation in a microporous observation cell."
2013-2014	Guleid Awale, Chemical Engineering, "Termite Endosymbiont Fractionation Using a Novel Microfluidic Cell Sorter."
2013	Ryan Carpenter, Chemical Engineering, I-REU with BASF (SUNY Albany), "Culturing a Multi-species Biofilm in a Microfluidic Flow Cell."
2012	Ann Aindow, Chemistry REU (UC Berkeley), "Chemotaxis of Bacteria to Novel Sugars."
2011-2012	Amanda Card, Chemical Engineering, "Optical Method for Measuring Diffusivity through Hydrogel-Filled Microfluidic Capillaries."

2011-2012 Leia Dwyer, Chemical Engineering, "Molecular Analysis of Protozoa in Microfluidic Trap Arrays."

2011-2012 Thomas Kelly, Chemical Engineering, "Optical Method for Measuring Diffusivity through Hydrogel-Filled Microfluidic Capillaries"

2010-2011 Kristina Gillick, Chemical Engineering, "Protozoa Signaling in Microfluidic Networks"

2010-2011 Megan Nolan, Chemical Engineering, "Trapping of Microbial Eukaryotes."

2010 Kate Nicholson, Chemical Engineering, "Development of a biofilm screening device for drug discovery."

2010 Alfredo Vázquez Rodríguez, Chemical Engineering, "Modeling diffusion through hydrogels" (Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey Mexico)

2009-2012 Leonela Villegas, Chemical Engineering, "Determining the Effect of Spacing in Protection of *Staphylococcus aureus* by *Pseudomonas*."

High School Teachers

2012 Kevin Dickson, West Haven High School, Biology and Environmental Science.

2011 Sacha Kelly, Big Picture High School, Bloomfield CT, Mathematics.

High School Students

2014 Sean J. Penrose, Northport Regional HS, Northport NY.

2013-2014 Ariana Javidi, E.O. Smith High School, Storrs CT.

VANDERBILT UNIVERSITY

Graduate Students – PhD (as committee member)

2002-2007 Wei Wang, Civil & Enviornmental Engineering, "The Effects of Micro-Scale Heterogeneity on Protozoan Movements in Porous Media."

Undergraduate Students

2007-2010 Jennifer L. Greene, Chemical Engineering, "Sorption and Diffusion of Organic compounds in PDMS"

2006-2010 Grant M. Bouchillon, Environmental Engineering, "Leaching of PAHs from cement-stabilized soil cores"

2007-2010 Adit Dhummakupt, Chemistry, "Information Cascading in Protozoa Populations"

2007-2009 Kathleen Grunder, Biomedical Engineering, "Development and Calibration of an Optical Oxygen Sensor for Microfluidic Devices"

2008 Nicholas Luibrand, Biomedical Engineering, "Development of Micro-structured Arrays for Microbial Diversity Studies"

2008-2009 Victoria Lopez, Biomedical Engineering, "Microscopic size and Microfluidic Devices"

2007 Samuel Nackman, Mechanical Engineering, "Growth Kinetics of Protozoa in Microfluidic Devices"

2008 Samantha Sabatinio, Environmental Engineering, "Simulating Natural Pore Structures with Microfluidic Devices"

Nashville State Technical Community College (NSF REU Co-op,), Nashville TN

2007-2009 Vanessa Allwardt, Biotechnology, "Development of the Quad Biofilm Array for Biomedical Research"

2007 John M. Mallard, Biotechnology, "Microbial Habitat Arrays for Microbiological Research and Education"

SERVICE and LEADERSHIP

Service and Leadership to the Profession

2013-present Programming Director, Water Section, Environmental Division, American Institute of Chemical Engineers (AIChE)

2011-present Director, Environmental Division, American Institute of Chemical Engineers (AIChE) (elected)

2009-2 Programming Co-Director, Water Section, Environmental Division, American Institute of Chemical Engineers (AIChE)

Programming for American Institute of Chemical Engineers (AIChE) Annual Meetings

- 2014 AIChE Annual Meeting, November 16-21, Atlanta GA
  - Topical Chair, AIChE National Meeting: "Sustainable Food Production"
  - Session Chair, "Engineering Challenges Facing Sustainable Food and Beverage Processing: A Dialogue with Industry and Academia."
  - Session Chair, "Sustainable Food Production Posters"
  - Session Chair, "Environmental Implications of Nanomaterials: Biological Interactions."

- 2013 AIChE Annual Meeting, November 3-8, San Francisco CA
  - Session Chair, "Environmental Implications of Nanomaterials: Biological Interactions."
  - Session Chair, "Environmental Implications of Nanomaterials: Fate and Transport."

- 2012 AIChE Annual Meeting, October 28-November 2, Pittsburgh PA
  - Topical Co-Chair, "Topical K: Sustaining Water for Future Generations."
  - Session Chair, "Advanced Sensors for Contaminant Detection."
  - Session Chair, "Environmental Implications of Nanomaterials: Biological Interactions."
  - Session Chair, "Environmental Implications of Nanomaterials: Fate and Transport."

- 2011 AIChE Annual Meeting, October 16-21, Minneapolis MN
  - Topical Co-Chair, "Topical C: Environmental Aspects, Applications, and Implications of Nanomaterials and Nanotechnology."
  - Session Chair, "Environmental Implications of Nanomaterials: Biological Interactions."
  - Session Chair, "Environmental Implications of Nanomaterials: Fate and Transport."
  - Session Chair, "Life Cycle Studies Associated with Nanomaterials and Nano-Enhanced Products."

- 2010 AIChE Annual Meeting, November 7-12, Salt Lake City NV
  - Session Chair, "Environmental Implications of Nanomaterials: Biological Interactions."
  - Session Chair, "Environmental Implications of Nanomaterials: Fate and Transport."

Outreach Activities

2009-present Presenter, Multiply Your Options (MyO), one-day workshop at UConn for middle school girls

2011-2 Mentor, Joule Fellows Program, 6-week summer research experience for teachers.

2011-2 Instructor, Explore Engineering (E^2) program for prospective engineer high school students

Community Engagement

2014-pres Vice-chair, Coventry Lake Advisory & Monitoring Committee, Coventry CT (elected)

2013-pres Member, Coventry Lake Advisory & Monitoring Committee, Coventry CT (appointed)

2013-pres Co-director, Beth El Congregation of Mansfield and UConn Hillel, youth religious school

2005-2009 Technical advisor to New York Academy of Sciences Pollution Prevention Committee, evaluated PAH pollution sources to the New York Harbor watershed

Peer Reviewing

Proposals: NSF (ad-hoc and review panels, multiple)

Journal Articles

- *Applied and Environmental Microbiology*
- *BMC Systems Biology*
- *Chemosphere*
- *Environmental Health Perspectives*
- *Environmental Science & Technology*
- *Environmental Toxicology and Chemistry*
- *Integrative Biology*
- *Journal of Environmental Quality*
- *Journal of Limnology & Oceanography*
- *PLOS One*
- *Chemical Society Reviews*

Professional Affiliations

- American Chemical Society (ACS) (2001-present)
- American Institute of Chemical Engineers (AIChE) (2008-present)
- American Society for Microbiology (ASM)
- Association of Environmental Engineering and Science Professors (AEESP)
- Society of Women Engineers (SWE)

UNIVERSITY OF CONNECTICUT

University-level Service

2012-pres	Co-Founder and Co-Director, UConn Nanofabrication Facility
2012-pres	Executive Committee Member, Center for Environmental Science & Engineering (CESE)
2009-pres	Member, Women in Math, Science, and Engineering Faculty Committee
2013-2014	Member, Dean of the School of Engineering Search Committee
2012-2013	Department Representative, University of Connecticut Graduate Faculty Council (elected)
2012-2013	Member, Molecular & Cellular Biology Faculty Search Committee (Microbiology)
2010	Member, University Committee to create the Environmental Studies major

Department-level Service

2013-pres	Chair, Chemical Engineering Capstone Design Projects & Standards Committee
2012-pres	Honors Advisor to undergraduate Chemical Engineering majors in the UConn Honors program, approx. 20 students/year.
2010-pres	Departmental Graduation Representative
2012-2013	Chair, Chemical Engineering Faculty Search Committee (Genomics cluster)
2012-2013	Chair, Biomedical Engineering Faculty Search Committee (Genomics cluster)
2011-2012	Member, Chemical Engineering Faculty Search Committee
2010-2013	Faculty Advisor, ΩXE, undergraduate chemical engineering honor society
2010-2013	Member, Departmental Undergraduate Education Committee
2011-2012	Organizer, Department Seminar Series
2009-2012	Academic Advisor to undergraduate Chemical Engineering majors, approx. 25 students/year.

VANDERBILT UNIVERSITY

University-level Service

2003-2009 Faculty Advisor, Society of Women Engineers (SWE) student chapter.

2007-2009 Faculty Mentor, Systems Biology and Bioengineering Undergraduate Research Experience (SyBBURE).

2006-2008 Faculty Advisor, Mayfield Lodge, "The Gender Gap in STEM: Research and Outreach."

2006-2008 Faculty VUceptor, Vanderbilt Visions Freshman Orientation Program (4 semesters).

2005-2006 Vanderbilt University Committee on Articulation of Norms and Values.

PREVIOUS APPOINTMENTS and EXPERIENCE

2005-2009 Research Assistant Professor, Department of Civil and Environmental Engineering, Vanderbilt University Nashville TN. (*Part time, on leave in 2005*)

- Developed microfluidic devices to measure protist motility in narrow channels.
- Industrial ecology and mass transport modeling for source apportionment of ubiquitous, non-point source, persistent and bioaccumulative toxins (PBTs).
- Developed a leaching and modeling approach to evaluate performance of *in situ* cement stabilization of PAH-contaminated manufactured gas plant soils.

2002-2004 Post-Doctoral Research Associate, Department of Civil and Environmental Engineering, Vanderbilt University Nashville TN. (*Part time, on leave in 2003*)
Mentor: Eugene J. LeBoeuf

- Developed microfluidic devices to measure effects of physical constrictions on protozoa migration and microbial population dynamics.

1999 Visiting Researcher, Energy Research Centre of the Netherlands (ECN), Petten NL
Mentor: Professor Rob N.J. Comans

- Measured binding of size-fractionated dissolved organic carbon to PAHs.
- Quantified effect of pH on leaching of PAHs from sediments.

1996-2002 Research Assistant, Rutgers, The State University of New Jersey, New Brunswick NJ
Major Advisor: David S. Kosson.

- Measured sequestration, desorption, and bioavailability of PAHs in well-characterized whole and size- and density-fractionated estuarine sediments.
- Developed a modeling approach to predict biodegradaton of PAHs in weathered whole sediments from *a priori* measurements of fundamental parameters.
- Developed a modeling approach to account for combined effects of mass transport resistance and toxicity in computing human health risk from exposure to contaminated sediments.

1997 National Institutes of Health Biotechnology Training Program Corporate Internship at Envirogen, Inc. (Now Shaw Environmental), Lawrenceville NJ.
Supervisor: Rob Steffan.

- Built and tested a pilot-scale fluidized bed reactor to degrade *tert*-butyl alcohol in contaminated groundwater.

1995-1996 Undergraduate Research Assistant. Department of Environmental Science, University of Virginia, Charlottesville VA,
Advisor: Aaron L. Mills.

- Isolated a bacterial strain able to move readily through sand columns.
- Investigated the effects of cell surface properties and mineral coatings on bacterial transport resistance through sand columns.