

# Leslie M. Shor, Ph.D.

*Assistant Professor*  
*Department of Chemical & Biomolecular Engineering*  
*Center for Environmental Sciences & Engineering*  
*University of Connecticut*  
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## **CURRENT POSITION**

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### *University of Connecticut, Storrs CT*

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**

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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)**

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### **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, Phase I.” 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 “ASCEND: 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 C. 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.

**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**

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*. In Press.

Schröfel, A, G Kratošová, I Šafařík, M Šafaříková, I Raška, LM Shor. 2014. Applications of biogenic metallic nanoparticles – a review.” *Acta Biomateriala*. In Press.

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

Markov DA, PC Samson, DK Schaffer, A Dhummakupt\*\*, JP Wiksw, 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 Wiksw, 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 Wiksw, 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 Wiksw, 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.

**Manuscripts in Review**

Orner\*\*, EP, JF Chau, EM Anderson\*\*, J Deng\*, AL Kadilak\*, RL Rubinstein\*, GM Bouchillon\*, DJ Gage, LM Shor. Pore-scale determination of microbially-mediated drying resistance using emulated soil micromodels. (Revise & Resubmit: *Soil Biology & Biochemistry*)

Bouchillon\*, GM, JF Chau, G. B. McManus, LM Shor. Microfluidic passive samplers for concentration and isolation of live protists. (*Analytical Methods*)

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

**Manuscripts in Preparation**

Kadilak\*, A, and LM Shor. “Hydrogel-filled capillaries as in-plane barriers for microfluidic cell culture applications.”

\*Denotes graduate student advisee

\*\*Denotes undergraduate student advisee

- Deng\*, J. and LM Shor. "Real-time respiration inhibition of *Staphylococcus aureus* biofilms with daptomycin exposure."
- Allwardt\*\*, V. D Jowhar, JM Davidson, DL McLean, C Janetopoulos, LM Shor, SR Opalenik, JP Wikswo, PC Samson. "Microfluidic approach to high-content analysis of eukaryotic and bacterial chemotaxis in non-linear, flow-free gradients."
- Shor, LM, W Wang, GM Bouchillon\*, T Rittenhaus, GL. Taghon, JP Wikswo, DS Kosson, EJ LeBoeuf. "Protozoa swarming in microstructured habitats: Insights into migration behaviors of crawling ciliates."
- DK Schaffer, DA Markov, P. C. Samson, R. S. Reiserer, V. Allwardt\*\*, D. Jowhar, C. Janetopoulos, S.R. Opalenik, JP Wikswo, LM Shor. "Milli-to-Micro: Soft lithography and rapid prototyping for Lab on a Well Plate."
- Tuorto, S.J., GL Taghon, DK Schaffer, PC Samson, DA Markov, LM Shor. "Long-term spatial distribution patterns of protozoa in arrays of connected microhabitats."

### **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, *In press*.
- 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, *In press*.
- Dhummakupt\*\*, A., PC Samson, D Markov, JP Wikswo, LM Shor. "Measuring Oxygen Concentration Under *Staphylococcus aureus* Biofilms in Response to Chemical Gradients in a Microfluidic 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 Hjelm, 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 Hjelm, 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.

\*Denotes graduate student advisee

\*\*Denotes undergraduate student advisee

## HONORS and AWARDS

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- 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

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### *Invited Presentations*

- 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.

\*Denotes graduate student advisee

\*\*Denotes undergraduate student advisee

*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) 247<sup>th</sup> 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 Principals 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.
- 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 Microfluidic 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)*

- 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) 247<sup>th</sup> National Meeting, March 16-20 2014, Dallas TX.
- Orner\*\*, E,\*\* E 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.**)

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\*\*Denotes undergraduate student advisee

- 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 2<sup>nd</sup>, 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 2<sup>nd</sup>, 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 2<sup>nd</sup>, 2012, Pittsburgh, PA. (1<sup>st</sup> 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) 244<sup>th</sup> 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) 244<sup>th</sup> 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) 244<sup>th</sup> 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) 244<sup>th</sup> 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) 46<sup>th</sup> Annual Region I Meeting, October 26-27, 2011, Randolph MA.

\*Denotes graduate student advisee

\*\*Denotes undergraduate student advisee

- 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. (**1<sup>st</sup> 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 Wiksw, LM Shor. "Microfluidic assay relating antimicrobial resistance of *Staphylococcus 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 Wiksw, LM Shor. Measuring Oxygen Concentration Under *Staphylococcus aureus* Biofilms in Response to Chemical Gradients in a Microfluidic Device, in Biomedical Engineering Society (BMES) Annual Meeting, October 2010, Austin, TX.
- Markov, DA, PC Samson, DK Schaffer, A Dhummakupt\*\*, JP Wiksw, 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 (3<sup>rd</sup> Place, Student Competition, Materials Division).
- Dhummakupt\*\*, A,\*\* JL Greene,\*\* PC Samson, JP Wiksw, 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 Wiksw, 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." 109<sup>th</sup> 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 (1<sup>st</sup> 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 (2<sup>nd</sup> Place, Student Competition, Biology Division).

\*Denotes graduate student advisee

\*\*Denotes undergraduate student advisee



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 Tagon, JP Wikswo, EJ LeBoeuf, DS Kosson. "Protozoan Predation Behavior in Microfluidic Habitat Networks." 108<sup>th</sup> General Meeting of the American Society of Microbiology, June 2008, Boston, MA.

## **TEACHING & LEARNING**

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### ***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) (New Course Developed)**

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.*
- *Semesters taught:*
  - Fall 2014, Enrollment: 73 (Honors enrollment: 13). *Upcoming.*
  - Fall 2013, Enrollment: 44 (Honors enrollment: 6). **Overall instructor rating: 5.0/5**
  - Fall 2012, Enrollment: 27 (Honors enrollment: 19). **Overall instructor rating: 8.0/10**

#### **2. Capstone Design II (CHEG 4143) (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.
- Semester taught:
  - Spring 2014. Enrollment: 48. *No student evaluations available.*

#### **3. Interdisciplinary Senior Design (ENGR 3195-01) (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

\*Denotes graduate student advisee

\*\*Denotes undergraduate student advisee

- geopolitical frameworks, as well as how to integrate individual contributions of into effective interdisciplinary teams.
- Semester taught:
    - Spring 2014: Enrollment: 7. *No student evaluations available.* (Co-instructor: A. Agrios)
- 4. Engineered Microhabitats Seminar** **(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.
  - Semester taught:
    - Spring 2014. Enrollment: 10. *No student evaluations available.*
- 5. Principles and Applications of Microfluidic Devices** **(New Course Developed)**  
 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.
  - Semester taught:
    - Spring 2012, Enrollment: 21. **Overall instructor rating: 8.3/10**
    - Spring 2011, Enrollment: 23. **Overall instructor rating: 8.2/10**
    - Fall 2009, Enrollment: 6. *No student evaluations available.*
- 6. Transport Phenomena I (CHEG 3123)**  
 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.”
  - Semester taught:
    - Fall 2011, Enrollment: 60 (Honors enrollment: 11). **Overall instructor rating: 9.2/10**
- 7. Introduction to Chemical Engineering (CHEG 2103)**  
 Sophomore-level core course, Chemical Engineering Program, 3 credits.
- Fundamentals of mass and energy balances and thermodynamic and kinetic principles.
  - Semester taught:
    - Fall 2010, Enrollment: 72 (Honors enrollment: 12). **Overall instructor rating: 8.3/10**  
 (Co-instructor: B. Willis)

***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**

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### **UNIVERSITY OF CONNECTICUT**

#### ***Summary: research advisor to***

- 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 Cruz, Environmental Engineering

#### ***Graduate Students – PhD (as committee member)***

- 2010-pres Kevin Huang, Polymers program. (Major Advisor: Doug Adamson.)
- 2010-pres Jason Arena, Chemical Engineering. (Major Advisor: Jeffrey McCutcheon.)
- 2010-pres 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***

- 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 - Other***

- 2014 Megan Greiner, Chemical Engineering, iREU with BASF (UMass), "Development of Scalable Microfluidic Devices for Enzyme Encapsulation."
- 2013-pres Haley Kopp, Chemical Engineering, in progress.
- 2013-pres Joshua Giambra, Chemical Engineering, "Gradient formation in a microporous observation cell."
- 2013-pres Jacob Lewis, Chemical Engineering, "Pore-scale Effects of Soil Structure on Water Retention."
- 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 & Environmental 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**

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### ***Service and Leadership to the Profession***

- 2011-present Director, Environmental Division, American Institute of Chemical Engineers (AIChE) (elected)
- 2009-present Programming 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<sup>2</sup>) 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

### ***Academic Service and Leadership, School- or University-level. University of Connecticut***

- 2012-pres Member, Center for Environmental Science & Engineering (CESE) Executive Committee
- 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

***Academic Service and Leadership, Department-level, University of Connecticut***

- 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)
- 2010-2013 Faculty Advisor,  $\Omega$ XE, 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.

***Academic Service and Leadership, School- or University-level, Vanderbilt University***

- 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.

***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)

## **PREVIOUS APPOINTMENTS and EXPERIENCE**

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- 2005-2009      Research Assistant Professor, Department of Civil and Environmental Engineering, Vanderbilt University Nashville TN. (*part time, on leave in 2005*)
- Developed microfluidic devices for real-time monitoring of microbe-habitat interactions within micro-structured networks.
  - 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.  
Committee: Balaji Narasimhan, Henrik Pedersen, Gary L. Taghon, and Lily Y. Young
- Measured sequestration, desorption, and bioavailability of PAHs in well-characterized whole and size- and density-fractionated estuarine sediments.
  - Developed a modeling approach to predict biodegradation 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,  
Advisors: Aaron L. Mills and George M. Hornberger.
- 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.

## **PERSONAL**

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Married to Mike Shor [www.mikeshor.com](http://www.mikeshor.com)

Children: Jacob Shor (age 11) and Eliana Shor (age 9)

US Citizen