



- Studied the differential toxicity of metallic and semiconducting single-walled carbon nanotubes and the relationship between nanotube toxicity and oxidative capability

**Graduate Research Assistant**, Rice University 2008-2009

- Fabricated ultrafiltration membranes containing a variety of nanoparticles, including nano-silver, nano-magnetite, and fullerenes
- Characterized membranes and assessed their biofouling and virus removal potential

**Undergraduate Research Assistant**, Rice University 2006-2008

- Characterized membrane properties and biofouling potential of carbon nanotube impregnated polysulfone membranes

**Undergraduate Research Assistant**, Dresden Technical University 2005

- Quantified the release of dissolved organic carbon from flocs disturbed during aeration under different coagulation conditions

## SELECTED ACCOMPLISHMENTS

- Contributing Writer, Materials Research Society Education and Outreach Webpage 2012-Present
- National Science Foundation Graduate Research Fellow 2009-2013
- Yale Scientific Teaching Fellow 2013
- American Chemical Society Graduate Student Award in Environmental Chemistry 2012
- Yale Camarata 2010-2012
- Yale Citations 2009-2011
- Texas Association of Environmental Professionals Scholarship 2008
- Rice Engineering Alumni Senior Merit Award 2007
- Chi Epsilon 2007
- Rice Undergraduate Scholars Program 2006-2007
- Rice Outdoors Club, Co-President 2006-2008
- Mayan Resorts Internship Program in Acapulco, Mexico 2006
- Research Internships in Science and Engineering in Dresden, Germany 2005
- Engineers Without Borders 2004-2005
- University Committee on Environmental Health and Safety 2005-2006
- Rice Light Opera Society - Ruddigore 2006
- Rice Chorale 2003- 2007

## PUBLICATIONS

1. K. R. Zodrow, E. Bar-Zeev, M. Elimelech, 2014. Biofouling and Microbial Communities in Membrane Distillation and Reverse Osmosis. *Environmental Science and Technology*, *in press*.
2. E. Bar-Zeev, K. R. Zodrow, S. E. Kwan, M. Elimelech, 2014. The importance of microscopic characterization of membrane biofilms in an unconfined environment. *Desalination* 348:8-15.
3. M. Ben-Sasson, X. Lu, E. Bar-Zeev, K. R. Zodrow, S. Nejati, G. Qi, E. P. Giannelis, M. Elimelech, 2014. *In situ* formation of silver nanoparticles on thin-film composite reverse osmosis membranes for biofouling mitigation. *Water Research* 62:260-270.

4. K. R. Zodrow, V. H. Coulter, E. Shaulsky, M. Elimelech, 2014. Low Flow Data Logger in Membrane Distillation: An Interdisciplinary Laboratory in Process Control. *Interdisciplinary Engineering Design Education Conference*.
5. K. R. Zodrow, M. E. Tousley, M. Elimelech, 2014. Mitigating Biofouling on Thin-Film Composite Polyamide Membranes Using a Controlled-Release Platform. *Journal of Membrane Science* 453:84-91.
6. M. Ben-Sasson, K. R. Zodrow, Q. Genggeng, Y. Kang, E. P. Giannelis, M. Elimelech, 2013. Binding of Biocidal Copper Nanoparticles to Thin-Film Composite Membranes. *Environmental Science and Technology* 48:384:393.
7. I. Alsvik, K. R. Zodrow, M. Elimelech, M. Hägg, 2012. Polyamide Formation on a Cellulose Triacetate Support for Osmotic Membranes: Effect of Linking Molecules on Membrane Performance. *Desalination* 312:2-9.
8. K. R. Zodrow, J. D. Schiffman, M. Elimelech, 2012. Biodegradable Polymer (PLGA) Coatings Featuring Cinnamaldehyde and Carvacrol Mitigate Biofilm Formation. *Langmuir* 28(39):13993-13999.
9. I. Raciny, K. R. Zodrow, D. Li, Q. Li, P. J. J. Álvarez, 2011. Addition of a Magnetite Layer onto a Polysulfone Water Treatment Membrane to Enhance Virus Removal. *Water Science and Technology* 63(10):2346-2352.
10. C.D. Vecitis, K. R. Zodrow, S. Kang, M. Elimelech, 2010. Electronic-Structure-Dependent Bacterial Cytotoxicity of Single-Walled Carbon Nanotubes. *ACS Nano* 4(9):5471-5479.
11. C. W. Lee, S. Mahendra, K. R. Zodrow, D. Li, Y. Tsai, J. Braam, P. J. J. Álvarez, 2010. Developmental Phytotoxicity of Metal Oxide Nanoparticles to *Arabidopsis Thaliana*. *Environmental Toxicology and Chemistry* 29(3):669-675.
12. K. R. Zodrow, L. Brunet, S. Mahendra, D. Li, A. Zhang, Q. Li, P. J. J. Álvarez, 2009. Polysulfone Ultrafiltration Membranes Impregnated with Silver Nanoparticles Show Improved Biofouling Resistance and Virus Removal. *Water Research* 43:715-723.
13. L. Brunet, D. Y. Lyon, K. R. Zodrow, J. -C. Rouch, B. Caussat, P. Serp, J. -C. Remigy, M. R. Wiesner, P. J. J. Álvarez, 2008. Properties of Membranes Containing Semi-dispersed Carbon Nanotubes. *Environmental Engineering Science* 25(4):565-576.

## ORAL PRESENTATIONS

1. K. R. Zodrow, V. H. Coulter, E. Shaulsky, M. Elimelech, 2014. Low Flow Data Logger in Membrane Distillation: An Interdisciplinary Laboratory in Process Control. Interdisciplinary Engineering Design Education Conference. Santa Clara, CA.
2. K. R. Zodrow, M. E. Tousley, M. Elimelech, 2013. Binding Polymer Particles with Encapsulated Antibacterial Compounds to Thin-Film Composite Membranes for Enhanced Biofouling Resistance. North American Membrane Society. Boise, ID.
3. K. R. Zodrow, M. E. Tousley, M. Elimelech, 2012. Binding Polymer Particles with Encapsulated Antimicrobials to Thin-Film Composite Membranes. Material Research Society, Fall Meeting. Boston, MA.

4. K. R. Zodrow, C. D. Vecitis, S. Kang, M. Elimelech, 2010. Electronic-Structure-Dependent Bacterial Cytotoxicity of Single-Walled Carbon Nanotubes. Robert M. Langer Graduate Student Symposium. New Haven, CT.
5. K. R. Zodrow, L. Brunet, S. Mahendra, A. Zhang, D. Li, Q. Li, P. J. J. Álvarez, 2009. Metal and Metal Oxide Nanoparticles in Polysulfone Ultrafiltration Membranes to Decrease Biofouling. IWA Leading Edge Technology Conference. Singapore.
6. K. R. Zodrow, D. Li, Q. Li, P. J. J. Álvarez, 2009. Using Metal and Metal Oxide Nanoparticles in Water Filtration Membranes to Reduce Bacteria Adhesion and Enhance Virus Removal. Engineering Conferences International. Trondheim, Norway.

## POSTER PRESENTATIONS

1. K. R. Zodrow, J. D. Schiffman, M. Elimelech, 2012. PLGA Coatings Featuring Cinnamaldehyde and Carvacrol Mitigate Biofilm Formation. American Chemical Society: Fall Meeting. Philadelphia, PA.
2. K. R. Zodrow, M. E. Tousley, M. Elimelech, 2012. Binding Polymer Nanoparticles with Encapsulated Natural Antimicrobials to Thin-Film Composite Membranes. Gordon Research Symposium and Conference: Membranes: Materials and Processes. New London, NH.
3. K. R. Zodrow, D. F. Rodrigues, D. P. Jaisi, M. Elimelech, 2010. Impact of Single-Walled Carbon Nanotubes on Soil Microbial Communities. Gordon Research Conference: Water. Holderness, NH.
4. K. R. Zodrow, L. Brunet, D. Y. Lyon, Q. Li, P. J. J. Álvarez, 2008. Incorporation of Silver Nanoparticles into Polysulfone Ultrafiltration Membranes for Biofouling Reduction. IWA Leading Edge Technology Conference. Zurich, Switzerland. (*First Place in Membrane Research Category*)
5. K. R. Zodrow, L. Brunet, D. Y. Lyon, P. J. J. Álvarez, 2007. Reduction of Biofouling of Water Filtration Membranes by the Incorporation of Antimicrobial Nanoparticles. Rice University Undergraduate Research Symposium. Houston, TX.
6. S. Müller, A. Lérch, K. R. Zodrow, W. Ühl, 2006. Floc Breakup due to Air Enhanced Cleaning of Immersed Membranes During Ultrafiltration. American Chemical Society Annual Conference. Atlanta, GA.

## TEACHING EXPERIENCE

<b>New Haven Reads Tutor:</b> Literacy Fundamentals	2012-2014
<b>New Haven Science Fair Mentor</b>	2012-2014
<b>Yale Splash Instructor</b> Materials and Water: Love? Hate? or Both?	Fall 2013, Spring 2014
<b>Yale Sprout Instructor</b> Peacocks, Beetles, and Cathedrals	Spring 2014
<b>Teaching Fellow</b> , Introduction to Environmental Engineering Yale University · Instructor: Menachem Elimelech	Spring 2011

**Teaching Assistant**, Problem-Based Learning in Engineering  
Rice University Fall 2008  
· Instructor: Ann Saterback

**Research Mentor** Yale University Fall 2012  
· First-Year Graduate Student: Sarah Bates

**Research Mentor** Rice University 2008-2009; 2014  
· Undergraduate Student: Peter Szemraj  
· Undergraduate Student: Zoltan Krudy  
· Undergraduate Student: Rachael Carson  
· Visiting Undergraduate Student: Josefina Fernandez

**Private Tutor**: Calculus, Chemistry, Physics, Algebra 2002-2008