

Ruth Ellen Richardson

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EDUCATION

Manhattan College	Chemical Engineering	B.S., 1994
University of California, Berkeley	Civil Engineering	M. S., 1995
University of California, Berkeley	Civil & Environmental Engineering	Ph. D., 2001

(Minors: Microbiology & Biochemistry; Soil Science)

EXPERIENCE

Cornell University; Ithaca, NY 1/2002 – present
Tenure-track Assistant Professor of Civil and Environmental Engineering
Elected to Graduate Faculty of the Field of Microbiology (7/2003)
Elected to Graduate Faculty of the Field of Toxicology (1/2006)

Malcolm Pirnie Environmental Consultants; White Plains, NY 6/1994 - 8/1994
Worked as an Engineer in the Odors and VOCs Group.

Air Products and Chemicals; Allentown, PA 6/1993 - 8/1993
Created a refinery expansion proposal for the conversion of petroleum coke into the gasoline oxygenate methyl-tertiary-butyl ether (MTBE).

New York Hospital/Cornell Medical College; New York, NY 1/1994 & 6/1992 - 8/1992
Researched through a Howard Hughes Medical Institute grant. Conducted invasion assay research on strains of *Mycobacteria* related to *M. tuberculosis* infecting HIV+ patients.

PUBLICATIONS

(i) Peer-reviewed journal articles: published and in-press

1. Rahm, BG, and **RE Richardson**. (2008) *Dehalococcoides*' gene transcripts as quantitative bioindicators of PCE, TCE and cDCE dehalorespiration rates. Accepted by *Environmental Science and Technology*
2. Rahm, BG, and **RE Richardson**. (2008) Correlation of Respiratory Gene Expression Levels and Pseudo-Steady State PCE Respiration Rates in *Dehalococcoides ethenogenes*. *Environmental Science and Technology*. 42 (2): 416-421.
3. *Morris, RM*, JM Fung, BG Rahm, S Zhang, DL Freedman, SH Zinder, and **RE Richardson**. (2007) Comparative Proteomics of *Dehalococcoides* spp. Reveals Strain-Specific Peptides Associated with Activity. *Applied and Environmental Microbiology* 73(1): 320-326.
4. *Morris, RM*, S Sowell, D Barofsky, SH Zinder, and **RE Richardson**. (2006) Transcription and mass-spectroscopic proteomic studies of electron transport oxidoreductases in *Dehalococcoides ethenogenes*. *Environmental Microbiology* 8 (9), 1499–1509.
5. Rahm, BG, *RM Morris*, and **Richardson, RE**. (2006) Temporal Expression of Respiratory Genes in an Enrichment Culture Containing *Dehalococcoides ethenogenes*. *Applied and Environmental Microbiology* 72(8): 5486–5491.
6. Freeborn, RA, VK Bhupathiraju, S Chauhan, KA West, BG Rahm, **RE Richardson**, and L Alvarez-Cohen. (2005) Phylogenetic Analysis of TCE-Dechlorinating Consortia

Enriched on a Variety of Electron Donors. *Environmental Science & Technology* 39, 8358-8368.

7. **Richardson, RE**, CA James, VK Bhupathiraju, and L Alvarez-Cohen. (2002) Microbial Rebound in Soils Following Steam Exposure. *Biodegradation*. 13: 285-295.
8. **Richardson, RE**, VK Bhupathiraju, DL Song, T Goulet, and L Alvarez-Cohen. (2002) Phylogenetic characterization of microbial communities that reductively dechlorinate TCE based upon a combination of molecular techniques. *Environmental Science & Technology* 36(12): 2652-2662.

(ii) Peer-reviewed conference proceedings and abstracts since Cornell appointment

1. Waller, AS, JJ Werner, EA Edwards, and **RE Richardson**. (2008) Combined Use of Microarrays and Metaproteome Analyses to Assess Community Gene Expression Regulation in *Dehalococcoides* –containing Mixed Microbial Consortia. *Abstracts of the 108th General Meeting of the American Society of Microbiology*, Boston, MA.
2. Heavner, GL, AR Rowe, BG Rahm, and **RE Richardson**. (2008) Adaptation of a Biokinetic Model for a PCE-Dechlorinating Mixed Culture to Incorporate Molecular Biological Data and to Describe Pseudo-Steady-State Behavior. *Abstracts of the 108th General Meeting of the American Society of Microbiology*, Boston, MA.
3. Werner, JW, SL Zhang, and **RE Richardson**. (2008) Quantitative Detection of Specific Microbial Enzymes in Complex Samples Via Multiple Reaction Monitoring (MRM) of Enzyme-specific Peptides: the Example of Chloroethene-Respiring *Dehalococcoides* Enzymes. *Abstracts of the 108th General Meeting of the American Society of Microbiology*, Boston, MA.
4. Rowe, AR, GL Heavener, and **RE Richardson**. (2008) Quantitation of population growth and decay for organisms present in a chloroethene reducing enrichment culture. *Abstracts of the 108th General Meeting of the American Society of Microbiology*, Boston, MA.
5. Fullerton, HE, SH Zinder, and **RE Richardson**. (2008) *In Situ* Populations of PCB-Dechlorinating Microorganisms in Hudson River Sediments. *Abstracts of the 108th General Meeting of the American Society of Microbiology*, Boston, MA.
6. Rahm, BG, and **RE Richardson**. (2007) Relating *Dehalococcoides*' Messenger RNA Levels to Chloroethene Dechlorination Rates. *Proceedings of the 9th International In situ and on site Bioremediation Symposium*. Baltimore, MD, May, 2007. **Winner, student paper competition.**
7. Powers, CA, **RE Richardson**, and NR Scott. (2007) Microbial Fuel Cell Operation and Use with Anaerobic Digestion for Power Production from Dairy Manure. *American Society of Agricultural and Biological Engineers Annual International Meeting*. June, 2007.
8. Rowe, AR, and **RE Richardson**. (2007) Monitoring expression of genes involved in the competition for hydrogen between *Dehalococcoides* and hydrogenotrophic methanogens in dechlorinating communities *The 107th General Meeting of the American Society of Microbiology*, Toronto, ON
9. Morris, RM, JM Fung, SH Zinder, and **RE Richardson**. (2006) Proteomic discrimination of *Dehalococcoides ethenogenes* electron-transporting oxidoreductases under different growth conditions. *Abstracts of the 106th General Meeting of the American Society of Microbiology*, Orlando, FL

10. Lazar, BJ, RM Morris, BG Rahm, and **RE Richardson**. (2005) Improved Detection of *Dehalococcoides* strains via Confocal Microscopy with FISH and Spatial Analysis of Biofloc Architecture in Reductive Dechlorinating Mixed Cultures. *Abstracts of the 105th General Meeting of the American Society of Microbiology*, Atlanta, GA
11. *Morris, RM, SH Zinder, and RE Richardson*. (2005). Differential expression levels of energy-converting respiratory genes in *Dehalococcoides ethenogenes* Strain 195. *Abstracts of the 105th General Meeting of the American Society of Microbiology*, Atlanta, GA
12. Jennings, LK, EL Warren, BG Rahm, and **RE Richardson**. (2004) Using fosmid libraries to isolate and characterize large genomic fragments of *Dehalococcoides* populations in a highly enriched community which fully dehalogenates PCE to ethene. *Abstracts of the 104th General Meeting of the American Society of Microbiology*, New Orleans, LA.
13. Rahm, BG, AC Fortin, VF Holmes, **RE Richardson**, and L. Alvarez-Cohen (2003) Application of Real-Time PCR to Quantify Reductive Dechlorination of TCE. *Abstracts of the 103rd Annual Meeting of the American Society for Microbiology*, Los Angeles, CA
14. **Richardson, RE**, and Rohit Gupta (2003) Characterization of acylated homoserine lactone (AHL)-dependent quorum sensing in municipal wastewater microbial communities and wastewater isolates. *Abstracts of the 103rd Annual Meeting of the American Society for Microbiology*, Los Angeles, CA

(iii) Reports and Book Chapters

1. **Richardson, RE**, and M Edwards. (2008) Vinyl Chloride and Organotin Stabilizers in Water Contacting New and Aged PVC Pipes. *Report to the American Water Works Association Research Foundation: Project 2991*
2. **Richardson, RE**. (2007) Development of mRNA-based dehalogenation rate constants. *Final Report to the Department of Energy/Westinghouse Savannah River Corporation Monitored Natural Attenuation/ Enhanced Passive Remediation (MNA/EPR)*
3. **Richardson, RE** and L Alvarez-Cohen. (2000) EPA Report CENWS-EC-TB-ET. Investigation into the potential for post-steam biodegradation of high molecular weight PAHs by soil microbes at the Wyckoff/Eagle Harbor Superfund Site. *Report submitted to EPA Region IX and the US Army Corps of Engineers Seattle District*
4. **Richardson, RE**. (1996) Environmental Ethics. Chapter 49. *In: Major Environmental Issues Facing the 21st Century*, L & MK Theodore (eds). Prentice Hall, Upper Saddle River, NJ

OUTREACH AND COMMUNITY EDUCATION

- Cayuga Lake Watershed Network. Board of Directors. August, 2005 – present. Promotes stewardship and monitors water quality in the watershed. Member of Issues Committee; Co-organizer of half-day symposium on Grasses to educate local farmers on potential benefits of grass planting (for energy feedstocks, water quality protection, and as feedstock for beef); Liaison between Cornell and CLWN on the Microbial Source Tracking project.
- Field Trips organized:
 - Biogeochemistry and Environmental Biocomplexity (NSF IGERT program) Fall Retreat– Ran Afternoon Field Trip: Field Marks of Microorganisms. Attended by students, faculty, and a local high school teacher. Fall, 2007

- CEE451 Microbial Field Trip with hands-on demonstrations of microbial activities in the environment. Attended by students, spouses, friends, and one faculty member from Ithaca College. Falls, 2005-2007.
- Cornell Sustainability Summit. Represented CEE at summit and had students in CEE658 put together a poster describing their Microbial Fuel Cells project. February, 2007.
- Ithaca Alternative Gift Fair. December, 2005-present. Member of Organizing Team that puts together a day-long event for holiday shoppers to donate to 30 non-profits in lieu of material gifts. In 2007, \$52,000 was raised in the one-day event.
- CURIE Academy (summer intensive course to introduce high school girls to engineering). Presentation on Civil and Environmental Engineering. (2004-2007)
- Panel Prospective Students Weekend for female high school students (October, 2006)
- American Association of University Women Skaneateles Chapter Annual Breakfast, Presentation on: *Environmental Stewardship: the (Lost) Art of Thinking Seven Generations Ahead*. May, 2005
- Student Reuse Project. Volunteered with the SRP. Helped to collect, sort and present furniture and house wares recovered during the May move out period in order to keep the items in use and out of the landfills. Spring, 2004

PROFESSIONAL MEMBERSHIPS

- American Society for Microbiology
- Association of Environmental Engineering and Science Professors
- American Association for the Advancement of Science
- Water Environment Federation