

## CURRICULUM VITAE

**Name:** Tamar Barkay

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### Education:

B.Sc. School of Agronomy, The Hebrew University, Rehovot; June 1974  
(Undergraduate degree in Agronomy, major in Microbiology)

M.Sc. Hebrew University, Jerusalem; June 1976  
(Master in Environmental Health)

Ph.D. The University of Maryland; December 1980  
(Major in Microbiology, Minor in Biochemistry)

### Academic positions

Professor Dept. of Biochemistry and Microbiology, Rutgers University, 2007 - Present

Associate Professor Dept. of Biochemistry and Microbiology, Rutgers University, 2003 – 2007

Assistant Professor Dept. of Biochemistry and Microbiology, Rutgers University, 1999 - 2003

### Other positions held

Visiting Associate Professor Center for Environmental Diagnostics and Bioremediation,  
University of West Florida, 1998 – 1999

Visiting Scientist Dept. of Molecular Microbiology and Biotechnology, Tel Aviv  
University, 1997 – 1998

Research Microbiologist Environmental Research Laboratory, The Environmental  
Protection Agency, 1984 – 1996

## Honors and Awards:

Charles H. Revson Postdoctoral Fellowship Award, Weizmann Institute, Rehovot, Israel, 1981-1982.  
University of California, Irvine, Career Development Award, 1983.  
National Research Council Residence Associateship, 1985 (declined).  
The Environmental Protection Agency Scientific and Technological Achievement Award in the Category of Ecology - Level II, 1988.  
Research Excellence Award, Cook College, Rutgers University, 2004  
Honorary Lectureship Award, Theobald Smith Society, 2005

## Grants and Contracts:

Intercampus Activities Fund, University of California, Irvine, Co-principal Investigator. 1983-1984  
National Science Foundation. Population Biology and Physiological Ecology. "An assessment of stressor induced gene occurrence in Soil Bacterial Communities". Co-Principal Investigator 1985-1986.  
EPA Region IV, RARE study on "Investigation on specific rates of mercury transformations as a source of methylmercury contamination in the Everglades drainage Basin". Oct. 1991 - Sept. 1992. \$50,000  
Electric Power Research Institution, Palo Alto, CA. "Bioremediation of mercury contaminated sites". Jan. 1992 - December 1993. \$215,487.  
Parks Service, Everglades National Park. "Methylation and demethylation Rtes in Everglades soils". Oct. 1991 - Sept. 1993. \$86,000.  
Electric Power Research Institution, Palo Alto, CA. "Genomic Characterization of environmental Isolates of *Pseudomonas cepacia*". Co-principle investigator with T.G. Lessie. July 1995 - June 1998. \$225,000.  
National Science Foundation. Environmental Geochemistry/Biogeochemistry Program. "Mercury biogeochemistry in a semi-arid aquatic ecosystem: Processes controlling methylation and demethylation" Co-principle investigator (1 of 5). Sept. 1995 - Aug. 1998. \$583,179.  
National Science Foundation. International Division. "Mercury biogeochemistry in the Idrija river system, Slovenia: Processes controlling methylation and demethylation". Co-principle investigator (1 of 5). June 1997 - July 2000. \$51,515.  
Israel Ministry of Science. Infrastructure Research. "Center for bioremediation of pollutants from industrial, urban and agricultural origin" Co-principle investigator (1 of 7). Jan. 98 Dec. 2000. IS 8,886,380 (\$2.5 M).  
Fisheries and Oceans, Canada. "The preparation of *mer-gfp* bioassessors for Hg(II)". Dec. 1998 - March, 2000  
Aluminum Company of America, Inc., "The development of bioassessors for determination of mercury that is bioavailable to mercury methylating bacteria in anaerobic sediments". Jan. 1999 - Dec. 2001. \$150,000  
National Science Foundation. Environmental Geochemistry/Biogeochemistry Program. "Collaborative study: Mercury cycling in soils: Dynamic sources for aquatic environments". Sept. 1999 - Aug. 2002. \$138,000.  
Department of Energy. NABIR Program. "Molecular and microcosm analyses of the potential for gene transfer in radionuclei and metal-contaminated subsurface environments". Sept.

- 1999 - Aug. 2002. \$809,000.
- National Science Foundation. International Division. "Mercury biogeochemistry in the Idrija river system, Slovenia: Processes controlling methylation and demethylation". Co-principle investigator (1 of 4). Sept. 1999 - Aug. 2002. \$64,000.
- New Jersey Water Resources Research Institute. "Factors controlling methylmercury degradation in Pine Barrens lakes". March 2000 – Feb. 2002. \$55,000.
- Cook College, Research Equipment Grant. "An optical thermocycler module to allow the quantitative analysis of specific genes and mRNA transcripts". Dec. 2000. \$35,000
- Rutgers University, Research Council Grant. "Factors controlling methylmercury accumulation in New Jersey's freshwater streams". 2001/2002. \$1,500.
- Rutgers Undergraduate Research Fellow Program. "Identification of *mer* genes in microorganisms from deep sea hydrothermal vents of the East Pacific Rise". (for Yein Chew) 2001 – 2002. \$1,500.
- Meadowlands Environmental Research Institute. "Factors controlling mercury contamination in Berry's Creek and downstream ecosystems". 2002 – 2003. \$63,602
- Rutgers Undergraduate Research Fellow Program. "Microbial diversity of *mer* genes in bacteria isolated from mercury contaminated environments". (for Christopher Asakiewicz) 2002 – 2003. \$1,500.
- Rutgers Undergraduate Research Fellow Program. "The isolation and characterization of new organomercury degrading enzymes". (for Rachel Kaletsky) 2002 – 2003. \$1,500.
- Department of Energy. NABIR Program. "Lateral gene transfer among subsurface bacteria". Lead PI (with P. Sobecky, GA Technical U.). Sept. 2002 - Aug. 2006. \$818,476.
- National Science Foundation. Biocomplexity Program. "Atmospheric deposition, transport, transformations and bioavailability of mercury across a northern forest landscape". Co-principle investigator (Lead PI: C. Driscoll, Syracuse U.). Aug. 2003 - July 2008. \$294,696.
- Department of Energy. NABIR Program. "Importance of mobile genetic elements and conjugal gene transfer for subsurface community adaptation to biotransformation of metals". Co-principle investigator (Lead PI: S. Sørensen, U. of Copenhagen). Sept. 2003 - Aug. 2006. \$149,251.
- Rutgers Undergraduate Research Fellow Program. "Mercury resistance among bacteria from mercury and sulfur enriched geothermal springs". (for Raul Singh) 2003 – 2005. \$1,500.
- Grants to Enhance the Undergraduate Curriculum and Teaching. "Experiences in applied and environmental molecular microbiology". Rutgers University. 2004. \$5,000.
- National Science Foundation and Dept. of Energy. "A workshop on horizontal gene flow in microbial communities". Co-PI (with B. smets, Uconn). ~\$100,000.
- Rutgers Undergraduate Research Fellow Program. "Isolation and characterization of novel *merA* sequences from anaerobic mercury resistant microorganisms". (for Rita Theofanopoulos) 2004 – 2005. \$1,500.
- National Science Foundation. Biogeoscience Program. "Collaborative research: Mercury isotope fractionation during microbial and abiotic redox transformations". Co-PI (with Joel Blum, U. of Michigan) Sept. 2004 – Aug. 2008. \$226,846.
- Department of Energy. NABIR Program. "Microbial pathways for the reduction of mercury in saturated subsurface sediments". Lead PI (with Lily Young and Gerben Zylstra, RU). \$694,769. Jan. 2005 – Dec. 2008.
- National Science Foundation. Research Experience for Undergraduates supplement to "Collaborative research: Mercury isotope fractionation during microbial and abiotic

redox transformations”, June 2005 – Aug. 2005. \$10,400  
Rutgers University Research Infrastructure Award. ”Upgrading temperature controlled incubation rooms in Lipman Hall”, 2006, \$35,000  
Rutgers University Research Infrastructure Award.” Upgrading of autoclaving facilities in Lipman Hall”, 2007, \$26,000  
E.I. du Pont de Nemours and Co. “Factors controlling methylmercury production in the South River, VA: Substrate bioavailability and potentials for methylation and demethylation”. \$93,280. Jan. 2008 – Dec. 2008.  
Department of Energy. ERSP Program. “Reduction of mercury in saturated subsurface sediments and its potential to mobilize mercury in its elemental form”. Lead PI (with Lily Young, Gerben Zylstra, Nathan Yee, RU and Ravi Kukkadapu, PNNL). \$996,813. Sept. 2008 – Aug. 2011.  
The European Commission/ FP7-PEOPLE-IIF-2008. “MERCTIC - Mercury biogeochemistry in the high Arctic”. Lead PI (with Niels Kroer, Aarhus University, Denmark). 143,000 Euro. Jan. 2010 – Dec. 2010.  
National Science Foundation/Geobiology&Low Temperature Geochemistry. “Collaborative research: mass-dependent and independent mercury isotope fractionation during microbial methylation and redox transformations of mercury in natural waters”. Co-PI (with John Reinfelder, RU, and Joel Blum, University of Michigan). \$468,495 (RU part). June 2010 – May 2013.  
Department of Energy. SBR Program. “Microbial Oxidation of Hg(0): Its Effect on Hg Stable Isotope Fractionation and Methylmercury Production”. Lead PI (with Nathan Yee and John Reinfelder). \$1,099,555. Sept. 2011 – Aug. 2014  
Utah, Dept. of Environmental Resources. “Mercury Biogeochemistry in Great Salt Lake: The Role of Microorganisms in Methylation”. Co-PI (with Bonnie Baxter [Westminster Collage] and Eric Boyd [Montana State University]). \$62,082. Sept. 2011 –Aug. 2012.

**Review boards and committees:**

Advisor. Mercury Accumulation Pathways and Processes. Bureau of Research, Wisconsin Department of Natural Resources. 1989  
Member of the Editorial Board, Applied and Environmental Microbiology: Jan. 1990 - July 1996.  
Member of the Editorial Board, Journal of Industrial Microbiology: Jan. 1996 - Dec. 1998.  
Electric Power Research Institute review committee on "Genetic and Microbial Ecology of Biofilms". 1991  
Florida Mercury Technical Committee - Advisory committee to Florida DER regarding mercury in fish and wildlife. 1991.  
Dept. of Energy, NABIR program, Proposal review panel. 2000  
Dept. of Energy, Microbial Genome Program, Proposal review panel. 2001  
Dept. of Energy, Science Advisory Board, Sub-committee for the NABIR program. 2003  
Dept. of Energy, Genome to Life Program, Proposal review panel. 2003  
Rice University, NSF Center of Excellence on Nano-biotechnology. Reviewer, 2003  
Nat. Inst. Health. General Medical Sciences. Minority Biomedical Research Support Program. Review panel (by teleconferencing), 2004  
Dept. of Energy, Microbial Genome Program, Proposal review panel. June 2004  
National Science Foundation, MIP Program, proposal review panel, Nov. 2004  
Dept. of Energy, Microbial Genome Program, Proposal review panel. May 2005  
National Science Foundation, MIP Program, proposal review panel, Feb. 2006

National Science Foundation, MIP Program, proposal review panel, Feb. 2007  
National Science Foundation, Organism Environment Interactions panel, Oct. 2009  
Oak Ridge National Laboratory, SFA Science Advisory Committee, 2009 - present

**Professional Organizations:**

American Society for Microbiology  
American Association for the Advancement of Science  
American Academy of Microbiology  
International Society for Microbial Ecology  
International Association of Geochemistry

**Professional publications:**

Olson, B.H., T. Barkay, D. Nies, M. Bellama and R.R. Colwell. 1979. Plasmid mediation of mercury volatilization and methylation by estuarine bacteria. *Develop. Ind. Microbiol.* **20**:275-284.

Olson, B.H., T. Barkay, and R.R. Colwell. 1979. The role of plasmids in mercury transformations by bacteria isolated from the aquatic environment. *Appl. Environ. Microbiol.* **38**:278-285.

Barkay, T., B. Olson, and R. R. Colwell. 1979. Heavy metal biotransformations mediated by estuarine bacteria. *Manage. Control Heavy Met. Environ. Int. Conf.* 1979, pp. 356-363.

McNicol, L.A., T. Barkay, M. J. Voll and R. R. Colwell. 1982. Plasmid carriage in *Aeromonas hydrophila* and other bacteria isolated from the aquatic environment. *J. Wash. Acad. Sci.* **72**:6066.

Barkay, T., and A. Goldfarb. 1982. Processing of bacteriophage T4 primary transcripts with ribonuclease III. *J. Molec. Biol.* **162**:299-315.

Barkay, T., S. Tripp, and B. H. Olson. 1983. The effect of sewage Sludge application on cadmium resistance in soil bacterial populations. *Manag. Control Heavy Met. Environ. Int. Conf.* 1983, pp. 309-313.

Barkay, T., and R. R. Colwell. 1983. Cell wall alteration responsible for increased resistance to mercurials in *Pseudomonas fluorescens* B69. *J. Gen. Microbiol.* **129**:2945-2950.

Barkay, T., D. L. Johnson, and B. H. Olson. 1984. Use of genetic adaptation to assess pollution in natural environments. *Environ. Manag. Int. Conf.* London 10-13 July 1984.

Barkay, T., S. Tripp, and B. H. Olson. 1985. The effects of metal rich sewage sludge application on the bacterial communities of grasslands. *Appl. Environ. Microbiol.* **49**:333-337.

Barkay, T., D. Fouts, and B. Olson. 1985. Preparation of a DNA gene probe for detection of mercury resistance genes in gram negative bacterial communities. *Appl. Environ. Microbiol.* **49**:686-692.

Colwell, R.R., D. Allen-Austin, T. Barkay, J. Barja, and J. D. Nelson, Jr. 1986. Antibiotic resistance associated with heavy metal mineralization. in: Mineral Exploration Biological Systems and Organic Matter. Carlisle, W., J. Berry, J. Watterson, and I. Kaplen (eds). Vol. 5. Princeton Hall, Inc. Englewood Cliffs, NJ p. 171-177.

Olson, B. H., and T. Barkay. 1986. The feasibility of using bacterial resistance to metals in mineral exploration. in: Mineral Exploration Biological Systems and Organic Matter. Carlisle, W., J. Berry, J. Watterson, and I. Kaplen (eds). Vol. 5. Princeton Hall, Inc. Englewood Cliffs, NJ p. 171-177.

Barkay, T., D. F. Shearer, and B. H. Olson. 1986. Toxicity testing in soil using microorganisms, in: Toxicity Testing Using Microorganisms Vol. II, Dutka, B. J., and G. Bitton (eds), CRC Press, Boca Raton, FL. p. 133-155.

Barkay, T., and B. H. Olson. 1986. Phenotypic and genotypic adaptation of aerobic heterotrophic sediment bacterial communities to mercury stress. Appl. Environ. Microbiol. **52**:403-406.

Levin, M.A., R. Seidler, A.W. Bourquin, J.R. Fowle III, and T. Barkay. 1987. EPA developing methods to assess environmental release. Bio/technology **5**:38-45.

Trevors, J.T., T. Barkay, and A.W. Bourquin. 1987. Bacterial gene transfer in soil and aquatic environments. A review. Can. J. Microbiol. **33**:191-198.

Barkay, T. 1987. Adaptation of aquatic microbial communities to Hg<sup>2+</sup> stress. Appl. Environ. Microbiol. **53**:2725-2732.

Ogram, A., G.S. Sayler, and T. Barkay. 1987. The extraction and purification of microbial DNA from sediments. J. Microbiol. Meth. **7**:57-66.

Genthner F.J., P. Chatterjee, T. Barkay, and A.W. Bourquin. 1988. Capacity of aquatic bacteria to act as recipients for plasmid DNA. Appl. Environ. Microbiol. **54**:115-117

Barkay, T., and G.S. Sayler. 1988. Gene probes as a tool for the detection of specific genomes in the environment. in: Aquatic Toxicology and Hazard Assessment: 10th Volume ASTM STP 971, Adams, W.J., G.A. Chapman, and W.G. Landis, (eds), American Society for Testing and Materials, Philadelphia, pp. 29-36.

Barkay, T., and P. Pritchard. 1988. Adaptation of aquatic microbial communities to pollutant stress. Microbiol. Sci. **5**:165-169.

Liebert C., and T. Barkay. 1988. A direct viable counting method for measuring tolerance of aquatic microbial communities to Hg<sup>2+</sup>. Can. J. Microbiol. **34**:1090-1095.

Barkay, T., D. Chatterjee, S. Cuskey, R. Walter, F. Genthner, and A. Bourquin. 1989. Bacteria and the environment. in: A Revolution in Biotechnology. J. Marx (ed). Cambridge University Press, Cambridge, New Rochelle, Melbourne, Sydney. pp. 94 - 102.

Barkay, T., C. Liebert, and M. Gillman. 1989. The environmental significance of the potential for *mer*(Tn21) mediated reduction of  $\text{Hg}^{2+}$  to  $\text{Hg}^0$  in natural waters. *Appl. Environ. Microbiol.* **55**:1196-1202.

Barkay, T., C. Liebert, and M. Gillman. 1989. Hybridization of DNA probes with whole community genome for detection of genes that encode microbial responses to pollutants: *mer* genes and  $\text{Hg}^{2+}$  resistance. *Appl. Environ. Microbiol.* **55**:1574-1577.

Summers, A.O., and T. Barkay. 1989. Metal resistance genes in the environment. in: *Gene Transfer in the Environment*. S. Levy, and R. Miller (Eds), McGraw-Hill Publishing Co. New York. pp. 287-308

Barkay, T., and R. Turner. 1989. Gene probes to predict responses of aquatic microbial communities to toxic metals. *Manag. Control Heavy Met. Environ. Int. Conf.* 1989, pp. 57.

Turner, R., A.J. VandenBrook, T. Barkay, and J.W. Elwood. 1989. Volatilization, methylation and demethylation of mercury in a mercury-contaminated stream. *Manag. Control Heavy Met. Environ. Int. Conf.* 1989, pp. 353.

Barkay, T., M. Gillman, and C. Liebert. 1990. Genes encoding mercuric reductases from selected gram negative aquatic bacteria have a low degree of homology with *merA* of transposon 501. *Appl. Environ. Microbiol.* **56**:1695-1701.

Liebert, C., T. Barkay, and R. Turner. 1991. Microbial acclimation to  $\text{CH}_3\text{Hg}^+$  and  $\text{Hg}^{2+}$  in a mercury polluted freshwater pond. *Microb. Ecol.* **21**:139-149.

Barkay, T., R. Turner, A. VandenBrook, and C. Liebert. 1991. The relationships of  $\text{Hg(II)}$  volatilization from a freshwater pond to abundance of *mer* genes in the gene pool of the indigenous microbial community. *Microb. Ecol.* **21**:151-161.

Barkay, T., and C. Liebert. 1991. Distribution of metal-resistant microorganisms in the environment, p. 663-682. in: Levin, M.A., R.J. Seidler, and M. Rogul (eds). *Microbial Ecology: Principles, Methods, and Applications*. McGraw-Hill, Inc., New York.

Barkay, T. The mercury cycle. 1992. *Encyclopedia of Microbiology*. Vol. 3 p. 65-74. Academic Press, Inc., San Diego.

Barkay, T., R. Turner, E. Saouter, and J. Horn. 1992. Mercury biotransformations and their potential for remediation of mercury contamination. *Biodegradation*. **3**:147-159.

Barkay, T., C. Liebert, and M. Gillman. 1993. Conjugal gene transfer to aquatic bacteria detected by the generation of a new phenotype. *Appl. Environ. Microbiol.* **59**:807-814.

Selifonova, O., R. Burlage, and T. Barkay. 1993. Preparation of bioluminescent sensors for detection of  $\text{Hg(II)}$  in the environment. *Appl. Environ. Microbiol.* **59**:3083-3090.

Saouter, E., R. Turner, and T. Barkay. 1994. Mercury microbial transformations and their potential for the remediation of a mercury-contaminated site. In: Means, J.L., and R.E. Hinchee

(eds), Emerging Technology for Bioremediation of Metals, Lewis Publishers, Boca Raton, FL. pp. 99-104.

Saouter, E., R. Turner, and T. Barkay. 1994. Microbial reduction of ionic mercury for the removal of mercury from contaminated environments. Proceedings of the Symposium on "Recombinant DNA technology II". Ann. NY Acad. Sci. **721**:423-427.

Devereux, R., T. Barkay, and J. Harvey. 1994. Application of microbial ecology research to environmental problems. Water Report: Quality, Resources and Technology **4**:8-11.

Selifonova, O., and T. Barkay. 1994. Role of sodium in transport of mercuric ions and induction of the Tn21 *mer* operon. Appl. Environ. Microbiol. **60**:3503-3507.

Nazaret, S., W.H. Jeffrey, E. Saouter, R. Von Haven, and T. Barkay. 1994. *merA* gene expression in aquatic environments measured by mRNA production and Hg(II) volatilization. Appl. Environ. Microbiol. **60**:4059-4065.

Saouter, E., M. Gillman, R. Turner, and T. Barkay. 1995. Development and field validation of a microcosm to simulate the mercury cycle in a contaminated pond. J. Environ. Toxicol. Chem. **14**:69-77.

Barkay, T., N. Kroer, L.D. Rasmussen, and S. J. Sorensen. 1995. Conjugal transfer at natural population densities in a microcosm simulating an estuarine environment. FEMS Microbiol. Ecol. **16**:43-54.

Barkay, T., S. Nazaret, and W. Jeffrey. 1995. Biodegradative genes in the environment. in: Transformation and Degradation of Toxic Organic Chemicals, Young, L. and C. Cerniglia (eds), J. Wiley Sons, Inc. pp. 545-577.

Saouter, E., M. Gillman, and T. Barkay. 1995. An evaluation of *mer* specified reduction of ionic mercury as a remedial tool of a mercury contaminated freshwater pond. J. Ind. Microbiol. **14**:343-348.

Oremland, R.S., L.G. Miller, P. Dowdle, T. Connell, and T. Barkay. 1995. Methylmercury oxidative degradation potentials in contaminated and pristine sediments of the Carson River, Nevada. Appl. Environ. Microbiol. **61**:2745-2753.

Vaithiyanathan, P., R.G. Kavanaugh, , C.B. Craft, C. J. Richardson, and T. Barkay. 1996. The role of eutrophication in the distribution and potential net methylation of mercury in the peat soils of the Everglade. Env. Sci. Technol. **30**:2591-2597.

Jeffrey, W.H., S. Nazaret, and T. Barkay. 1996. Detection of the *merA* gene and its expression in the environment. Microb. Ecol. **32**:293-303.

Sørensen, S.J., N. Kroer, E. Sørensen, G. Sengeløv, and T. Barkay. 1996. Conjugation in aquatic environments. in: Molecular Microbial Ecology Manual, Akkermans, A.D.L., J.D. van Elsas, and F.J. de Bruijn (eds.), Kluwer Academic Publishers.

Rasmussen, L.D., R.R. Turner, and T. Barkay. 1997. Cell-density dependent sensitivity of a *mer-lux* bioassay. *Appl. Environ. Microbiol.* **63**:3291-3293.

Barkay, T., M. Gillman, and R.R. Turner. 1997. Effects of dissolved organic carbon and speciation of Hg(II) on bioavailability of mercury. *Appl. Environ. Microbiol.* **63**:4267-4271.

Barkay, T. 1997. A *mer-lux* reporter system to study factors that determine mercury availability to bacteria. in: *Progress in Microbial Ecology*, Martins, M.T. M.I.Z. Sato, J.M. Tiedje, L.C.N. Hagler, J. Döbereiner, and P.S. Sanchez (eds), SBM - Brazilian Society for Microbiology, São Paulo, Brazil, pp. 551-557.

Kroer, N., T. Barkay, S.J. Sørensen, and D. Weber. 1998. Effects of root exudates and bacterial metabolic activity on conjugal gene transfer in the rhizosphere of a marsh plant. *FEMS Microbiol. Ecol.* **25**:375-384.

Barkay, T., R.R. Turner, L.D. Rasmussen, C. Kelly, and J. Rudd. 1998. Lux-facilitated detection of mercury in natural waters. in: *Bioluminescent Protocols*, LaRossa, R. (ed). Humana Press, Inc. Totowa, NJ. pp. 231-246.

Kurtz, J.C., R. Devereux, T. Barkay, and R.B. Jonas. 1998. Evaluation of sediment slurry microcosms for modeling microbial communities in estuarine sediments. *Environ. Toxicol. Chem.* **17**:1274-1281.

de Liphay, J.R., T. Barkay, J. Vekova, and S.J. Sørensen. 1999. Utilization of phenoxyacetic acid by strains using either the *ortho* or *meta* cleavage of catechol during phenol degradation after conjugal transfer of *tfdA*, the gene encoding a 2,4-dichlorophenoxyacetic acid/2-oxoglutarate dioxygenase. *Appl. Microbiol. Biotechnol.* **51**:207-214.

Rosenberg, E., T. Barkay, S. Navon-Venezia, and E.Z. Ron. 1999. Role of *Acinetobacter* bioemulsans in petroleum degradation. In: *Novel Approaches for Bioremediation of Organic Pollution*. Fass, R., Y. Flashner, and S. Reuveny (eds) Kluwer Academic/Plenum Publishers, New York, pp/ 171-180.

Barkay, T., S. Navon-Venezia, E.Z. Ron, and E. Rosenberg. 1999. Enhanced solubilization and biodegradation of polyaromatic hydrocarbons by the bioemulsifier alasan. *Appl. Environ. Microbiol.* **65**:2697-2702.

Barkay, T. The mercury cycle. 2000. *Encyclopedia of Microbiology*. 2nd edition. Academic Press, Inc., San Diego. pp. 171-181.

Rasmussen, L.D., S.J. Sørensen, T.R. Turner, and T. Barkay. 2000. Application of a *mer-lux* biosensor for estimating bioavailable mercury in soil and its utility in relating the response of soil microbial communities to bioavailable mercury. *Soil Biol. Biochem.* **32**:639-646.

Hines, M.E., M. Horvat, J. Faganeli, J.-C. Bonzongo, T. Barkay, E.B. Major, K.J. Scott, E.A. Bailey, J.J. Warwick, and W.B. Lyons. 2000. Mercury biogeochemistry in the Idrija River, Slovenia from above the mine into the Gulf of Trieste. *Environ. Res.* **83**:129-139.

de Liphthay, R.J., T. Barkay, and S.J. Sørensen. 2001. Enhanced degradation of phenoxyacetic acid in soil by horizontal transfer of the *tfdA* gene encoding a 2,4-dichlorophenoxyacetic acid dioxygenase. *FEMS Microbiol. Ecol.* **35**:75-84.

Barkay, T., and J. Schaefer. 2001. Metal and radionuclide bioremediation: Issues, considerations, and potentials. *Curr. Opin. Microbiol.* **4**:318-323.

Barkay, T. 2001. Molecular and biochemical investigation of the potential for microbial mercury volatilisation in the Idrijca River – Gulf of Trieste ecosystem. *Materials Geoenviron.* **48**:109-115.

Schaefer, J.K., R. Dorn, and T. Barkay. 2001. Microbial factors controlling methylmercury accumulation in freshwater ecosystems in New Jersey, USA. *Materials Geoenviron.* **48**:219-225.

Sørensen, S.J., J. Radnoti de Liphthay, A.K. Müller, T. Barkay, L.H. Hansen, and L.D. Rasmussen. 2002. Molecular methods for assessing and manipulating the diversity of microbial populations and processes. In: *Enzymes in the Environment*. Burns, R.G. (ed). Marcel Dekker. pp. 363 – 389.

Schaefer, J.K., J. Letowski, and T. Barkay. 2002. *mer*-mediated resistance and volatilization of Hg(II) under anaerobic conditions. *Geomicrobiol. J.* **19**:87-102.

de Liphthay, J.R., J. Aamand, and T. Barkay. 2002. Expression of the *tfdA* gene in aquatic microbial communities during degradation of 2,4-dichlorophenoxyacetic acid. *FEMS Microbiol. Ecol.* **40**:205-214.

Golding G.R., C.A Kelly, R. Sparling, P.C. Loewen, J.W.M. Rudd, and T. Barkay. 2002. Demonstration of facilitated uptake of Hg(II) by *Vibrio anguillarum* and *Escherichia coli* under anaerobic and aerobic conditions. *Limnol. Oceanog.* **47**:967-975.

Benyehuda, G., J. Coombs, P.M. Ward, D. Balkwill, and T. Barkay. 2003. Metal resistance among aerobic chemoheterotrophic bacteria from the deep terrestrial subsurface. *Can. J. microbiol.* **49**:151-156.

Barkay, T., S. Miller, and A.O. Summers. 2003. Bacterial mercury resistance from atoms to ecosystems. *FEMS Microbiol. Rev.* **27**:355-384.

Coombs, J.M., and T. Barkay. 2004. Molecular evidence for the evolution of metal homeostasis genes by lateral gene transfer in bacteria from the deep terrestrial subsurface. *Appl. Environ. Microbiol.* **70**:1698-1707.

Schaefer, J.K., J. Yagi, J. Reinfelder, T. Cardona, K. Ellickson, S. Tel-Or, and T. Barkay. 2004. The role of the bacterial organomercury lyase (MerB) in controlling methylmercury accumulation in mercury contaminated natural waters. *Env. Sci. Technol.* **38**:4304-4311.

Poulain, A., M. Amyot, D. Findlay, S. Telor, T. Barkay, and H. Hintelmann. 2004. Biological and photochemical production of dissolved gaseous mercury in a boreal lake. *Limnol. Oceanog.* **49**:2265-2275.

Vetriani, C., Y.S., Chew, S.M. Miller, J. Yagi, R.A. Lutz, and T. Barkay. 2005. Mercury adaptation among bacteria from a deep-sea hydrothermal vent. *Appl. Environ. Microbiol.* **71**:220-226.

Barkay, T., and I. Wagner-Döbler. 2005. Microbial transformations of mercury: potentials, challenges, and achievements in controlling mercury toxicity in the environment. *Adv. Appl. Microbiol.* **57**:1-52

Wiatrowski, H.A., and T. Barkay. 2005. Monitoring of microbial metal transformations in the environment. *Curr. Opin. Biotechnol.* **16**:261-268

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Crane, S., T. Barkay, and J. Dighton. The effect of mercury on the establishment of *Pinus rigida* seedlings and the development of their ectomycorrhizal communities. *Fungal Ecol.* In revision

Lin, C.-C., N. Yee, and T. Barkay. Microbial transformation in the mercury cycle. *In: Environmental Chemistry and Toxicology of Mercury.* G. Liu, Y. Cai, and N. O’Driscoll (eds.). John Wiley & Sons, Inc. In print

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Lin, C.-C., Y. Wang, H. Wiatrowski, N. Yee, and T. Barkay. Redox cycling of Hg in dissimilatory nitrate-reducing enrichments derived from subsurface sediments. In preparation.

Yu, R.-Q, I. Adato, J.K. Schaefer, T. Barkay, and M. Hines. Bacterial diversity in an acidic freshwater wetland: Potential links to mercury methylation. In preparation

Coombs, J.M., A. Chatziefthimiou, P.A. Sobecky, and T. Barkay. A DNA hybridization array for the analysis of the genetic linkage of metal resistance genes on bacterial plasmids. In preparation

Wiatrowski, H. et al., The *merA-2* gene is not responsible for mercury(II) resistance or reduction in *Geobacter sulfurreducens* PCA. Appl. Environ. Microbiol. In preparation

### **Professional presentations:**

Barkay, T., B. H. Olson, and R. R. Colwell. Plasmid mediation of mercury transformations by estuarine and marine bacteria. 78th Annu. Meet. Am. Soc. Microbiol. Las Vegas, May 14-19, 1978.

Colwell, R. R., and T. Barkay. The ecology of plasmids in the aquatic environment. Conference on Taxonomical Computer Identification of Bacteria and Diagnostic Methods. Liblice Castle, Czechoslovakia, May 58, 1980.

Colwell, R.R., T. Barkay, and S. Berk. Microbiol mobilization of mercury in aquatic systems. Fifth International Symposium on Environmental Biogeochemistry. Stockholm, June 15, 1981.

Goldfarb, A., T. Barkay and V. Daniel. An *E. coli* endonuclease responsible for primary cleavage of in vitro transcripts of bacteriophage T4 tRNA gene cluster. Cold Spring Harbor, August 20-24, 1981.

Goldfarb, A., T. Barkay and V. Daniel. Endonucleases involved in processing of transcripts of bacteriophage T4 tRNA gene cluster. UCLA Symposia on Gene Regulation. March 28 - April 4, 1982.

Olson, B. H., T. Barkay, and I. Thornton. Can metal resistance patterns of soil bacteria be used to identify potential mineral deposits? Organic Matter, Biological Systems, and Mineral Exploration. A Colloquium. UCLA, February 14-18, 1983.

Colwell, R. R., T. Barkay, and D. Allen. Antibiotic resistance associated with heavy metal mineralization. Organic Matter, Biological Systems, and Mineral Exploration. A Colloquium. UCLA, February 14-18. 1983.

Tripp, S., T. Barkay, and B. H. Olson. The relationship between heavy metal contamination and soil bacteria. Organic Matter, Biological Systems, and Mineral Exploration. A Colloquium. UCLA, February 14-18, 1983.

Tripp, S., T. Barkay, and B. H. Olson. The effect of cadmium on the community structure of soil bacteria. 83<sup>rd</sup> Annu. Meet. Am. Soc. Microbiol. New Orleans, March 6-11, 1983.

Barkay, T., S. Tripp, and B. H. Olson. The ecology of cadmium resistant bacteria in the soil environment. 3<sup>rd</sup> International Symposium on Microbial Ecology. Michigan State University. Aug. 7-12, 1983.

Colwell, R. R., T. Barkay, and D. Allen. Plasmid mediated heavy metals and antibiotic resistance as a factor in microbial transformations in the environment. 5th International Conference on Heavy Metals in the Environment. Heidelberg, Sept. 6-9, 1983.

Tripp, S., T. Barkay, and B. Olson. Coselection of heavy metal and antibiotic resistances in soil bacterial communities. 84<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. St. Louis, March 4-9, 1984.

Barkay, T., and B. Olson. Genetic probes for tracking specific genes within microbial communities of natural ecosystems. Invited Seminar. 85<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Las Vegas, March 3-7, 1985.

Barkay, T., M. Stewart, J. Watterson, and B. Olson. Heterotrophic bacterial communities of mercury enriched soils. 85<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Las Vegas, March 3-7, 1985.

Barkay, T., and A.W. Bourquin. Adaptation to Hg<sup>2+</sup> in estuarine microbial communities. 86<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Washington, DC., March 23-28, 1986.

Barkay, T., S. Cuskey, D. Chatterjee, F. Genthner and A. Bourquin. Risk assessment of the deliberate release of genetically engineered microorganisms (GEMs) to aquatic environments. 7<sup>th</sup> Annu. Meet. SETAC. Washington, D.C., Nov. 2-4, 1986.

Barkay, T., D. Walter, D. Chatterjee, F. Genthner, S. Cuskey, R. Devereux, and A. Bourquin. Use of DNA gene probes for the detection of genetically engineered organisms in aquatic environments. Invited symposium talk. 87<sup>th</sup> Annu. Meet. Soc. Microbiol. Atlanta, March 1-6, 1987.

Barkay, T., and A. Bourquin. Adaptation to Hg<sup>2+</sup> stress by aquatic microbial communities. 87<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Atlanta, March 1-6, 1987.

Barkay, T., M. Gillman, and C. Liebert. The role of the *mer* gene in the response of aquatic microbial communities to mercury. 88<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Miami Beach, May 8-13, 1988.

Devereux, R., M. Delaney, and T. Barkay. Detection of sulfate-reducing bacteria in aquatic sediments by hybridization with rRNA specific oligonucleotide probes. 88<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Miami Beach, May 8-13, 1988.

Barkay, T., C. Liebert, and R. Turner. Adaptation of freshwater microbial communities to  $\text{Hg}^{2+}$ . 9<sup>th</sup> Annu. Meet. SETAC. Arlington, Virginia, Nov. 13-17, 1988.

Liebert, C., M. Gillman, and T. Barkay. Relative abundance of *mer* genes in microbial gene pools. 89<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. New Orleans, La, May 14-18, 1989.

Temple, K.A., R.R. Turner, and T. Barkay. Volatilization of divalent mercury and demethylation of methylmercury: Microbial adaptation in a mercury-contaminated site. 89<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. New Orleans, La, May 14-18, 1989.

Barkay, T. Adaptation of microbial communities to mercury. Invited talk. Gordon Conference on Applied and Environmental Microbiology. July, 1989.

Barkay, T. Gene probes to predict responses of aquatic microbial communities to toxic metals. 7<sup>th</sup> International Conference on Heavy Metals in the Environment. Geneva, Sept. 12-15, 1989.

Liebert, C., T. Barkay, R. Turner, and N. Bloom. Acclimation to  $\text{CH}_3\text{Hg}^+$  and  $\text{Hg}^{2+}$  of aquatic microbial communities from a mercury polluted pond. 90<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Anaheim, CA, May 13-17, 1990.

Turner, R.R., T. Barkay, and A.J. VandenBrook. Biotransformations of mercury in contaminated and control streams in relation to the abundance of microbial gene sequences encoding mercury resistance. International Conference on Mercury as an Environmental Pollutant. Gavle, Sweden, June 11-13, 1990.

Kurtz, J.C., R.B. Jonas, T. Barkay, and R. Devereux. Sediment microcosm systems for investigations of microbial community structure and function. 11<sup>th</sup> Annu. Meet. SETAC. Arlington, Virginia, Nov. 11-15, 1990.

Devereux, R., C. Liebert, T. Barkay, and D.A. Stahl. Hybridization of fluorescent dye-labeled rRNA probes to bacteria extracted from sandy marine sediment. 91<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Dallas, TX, May 5-9, 1991.

Sørensen, S.J., and T. Barkay. Experimental approach for the detection of gene transfer from GEM's to bacteria indigenous to aquatic environments. 3<sup>rd</sup> Symposium on Bacterial Genetics and Ecology. Villerfranche sur Mer, France, Nov. 20-22, 1991.

Barkay, T., and R. Turner. Biological removal of  $\text{Hg}(\text{II})$  from a contaminated freshwater pond. 203<sup>th</sup> Am. Chem. Soc. Nat. Meet. San Francisco, CA. Apr. 5-10, 1992.

Barkay, T. Mercury bioremediation. A symposium on the "Use of Natural and Genetically Engineered Microorganisms to Combat Pollution". Kiriat Anavim, Israel. May 9-19, 1992.

Barkay, T., and R. Turner. Use of microbial activity to remove mercury from contaminated water. 92<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. New Orleans, LA. May 26-30, 1992.

Barkay, T., C. Liebert, and M. Gillman. Gene transfer from GEMs to aquatic bacteria. 92<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. New Orleans, LA. May 26-30, 1992.

Kurtz, J., T. Barkay, R. Devereux, and R.B. Jonas. Pentachlorophenol effects on microbial community function in estuarine sediment microcosms. 92<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. New Orleans, LA. May 26-30, 1992.

Turner, R., E. Saouter, and T. Barkay. The role of biotic and abiotic mercury reduction and volatilization in the removal of mercury from a contaminated stream and pond. Mercury as a Global Pollutant - Toward Integration and Synthesis. International Conference. Monterey, CA. May 31-June 4, 1992.

Nazaret, S., W.H. Jeffrey, R. Von Haven, E. Saouter, and T. Barkay. *mer* gene expression in aquatic environments. 93<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Atlanta, May 16-20, 1993.

Selifonova, O., R. Burlage, and T. Barkay. *mer-lux* based biosensors for detection of Hg(II) in contaminated water. 93<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Atlanta, May 16-20, 1993

Barkay, T., C. Liebert, N. Kroer, and S. Sørensen. Failure to detect conjugal transfer to indigenous bacteria in estuarine microcosms. 93<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Atlanta, May 16-20, 1993

Selifonova, O., and T. Barkay. The effect of sodium on mercury uptake by *E. coli*. 94<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Las Vegas, May 23-27, 1994.

Kurtz, J., T. Barkay, R. Devereux, and R.B. Jonas. Effects of pentachlorophenol on microbial community processes in estuarine sediment microcosms. 94<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Las Vegas, May 23-27, 1994.

Barkay, T., P. Vaithiyathan, R. Kavanaugh, E. Saouter, and C.J. Richardson. Is there a role for eutrophication in methylmercury accumulation in the Florida Everglades? ASLO/PSA Conference, Miami, FL. June 12-16, 1994.

Barkay, T. Molecular mechanisms of adaptation of microbial communities to stress. International Workshop on New Approaches in Microbial Ecology. Aug. 21-24, 1994. Helsingor, Denmark.

Oremland, R.S., L.G. Miller, P. Dowdle, T. Connell, and T. Barkay. Oxidative mercury demethylation potentials in sediments from the Carson River, Nevada. 95<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Washington DC, May 21-25, 1995.

Kroer, N., T. Barkay, S.J. Sørensen, and D. Weber. Influence of root exudates and bacterial metabolic activity on apparent conjugal gene transfer frequencies in the rhizosphere of water grass (*Echinochloa crusgali*). 95<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Washington DC, May 21-25, 1995.

Barkay, T. Invited presentation. Factors determining availability of mercury to bacteria. 95<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Washington DC, May 21-25, 1995.

Barkay, T. Invited presentation. Factors determining availability of mercury to bacteria. The 7<sup>th</sup> International Symposium on Microbial Ecology. Santos, Brazil, Aug. 27-Sept. 1, 1995.

Sørensen, S.J., L.E., Jensen, N. Kroer, A. Petersen, and T. Barkay. Gene transfer in interfaces in aquatic and terrestrial environments. The 7<sup>th</sup> International Symposium on Microbial Ecology. Santos, Brazil, Aug. 27-Sept. 1, 1995.

Sørensen, S.J., J. Vekova, and T. Barkay. Assembly of catabolic pathways by horizontal gene transfer from GEMs to indigenous bacteria. International Seminar on Biosorption and Bioremediation. Prague, Czech Republic, Oct. 1-4, 1995.

Barkay, T., E. Saouter, and R.R. Turner. Microbial activities for the bioremediation of mercury contamination. Second SETAC World Congress. Vancouver, Canada, Nov. 5-9. 1995.

Turner, R.R., T. Barkay, and L.D. Rasmussen. Recovery of mercury-contaminated sites: Role of mercury-resistant bacteria. 4<sup>th</sup> International Conference on Mercury as a Global Contaminant, Hamburg, Germany, Aug. 4-8, 1996.

Turner, R.R., T. Barkay, and L.D. Rasmussen. Development and application of an indicator of the bioavailability of mercury to microorganisms. An EPA/DOE Workshop on Mercury Speciation and Bioavailability, Denver, Colorado, Sept. 17-19, 1996.

Bonzongo, J.C., W.B. Lyons, J.J. Warwick, M.E. Hines and T. Barkay. 1997. Levels, speciation and fate of mercury in the Carson River system. Presented at the Geol. Soc. Amer. Annual Meeting, Salt Lake.

Barkay, T., S. Navon-Venezia, P.A. Willumsen, E.Z. Ron, and E. Rosenberg. Alasan-enhanced solubilization and biodegradation of polyaromatic hydrocarbons. Novel Approaches for Bioremediation of Organic Pollution. 42<sup>nd</sup> OHOLO Conference, Eilat, Israel, May 3-7, 1998.

Barkay, T., S. Navon-Venezia, P.A. Willumsen, E.Z. Ron, and E. Rosenberg. Alasan-enhanced solubilization and biodegradation of polyaromatic hydrocarbons. 98<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Atlanta, May 17-21, 1998.

Hines, M.E., M. Horvat, J. Faganeli, J-C.J. Bonzongo, T. Barkay, E.B. Major, K. Scott, E.A. Bailey, J.J. Warwick, and W.B. Lyons. Mercury biogeochemistry in the Idrija River, Slovenia: From above the mine into the Gulf of Trieste. 5<sup>th</sup> International Conference on Mercury as a Global Pollutant. Rio de Janeiro, Brazil, May 23-28, 1999.

Barkay, T., M. Hines, J-C. Bonzongo, K. Scott, P. Kringelum, W.B. Lyons, J.J. Warwick, And J. Faganeli. Molecular analysis of a mercury contaminated aquatic ecosystem. 99<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Chicago, May 30-June 3, 1999.

Hines, M.E., S. Nadig, T. Barkay, J-C.J. Bonzongo, and E.A. Bailey. Mercury methylation/demethylation and the *mer* operon in the Carson River, Nevada. 99<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Chicago, May 30-June 3, 1999.

Barkay, T., C. Kelly, G. Golding, K. Scott, and J. Rudd. Microbial “biosensors” to measure bioavailable mercury in the environment. 11<sup>th</sup> International Biodeterioration and Biodegradation Symposium, Arlington, VA, Aug. 1-6, 1999.

Kelly, C.A., K.J. Scott, J.W.M. Rudd, T. Barkay, and M. Holoka, M. A new, aquatic “bioreporter” for measurement of bioavailable mercury in aquatic environments. A&WMA International Specialty Conference on Mercury in the Environment. Bloomington, Minnesota, September 15-17, 1999.

Barkay, T., S. Sørensen, and N. Kroer. Molecular and microcosms analyses of the potential for gene transfer in radionuclei and metal-contaminated subsurface environments. DOE-NABIR PI Workshop. Reston VA. Jan. 31–Feb. 2, 2000

Barkay, T. Microbial transformations: A critical factor determining Hg toxicity. Invited talk. 100<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Los Angeles, May 21–25, 2000.

Barkay, T. Mercury biosensors. Invited talk. Annu. Meet. Can. Soc. Microbiol. Winnipeg, Manitoba, June 11–14, 2000.

Barkay, T., G. Benyehuda, and D. Balkwill. Metal resistance among bacteria isolated from subsurface cores. DOE-NABIR PI Workshop. Warrenton, VA. March 12-14, 2001.

Golding, G., C.A. Kelly, R. Sparling, P.C. Loewen, J.W.M. Rudd, and T. Barkay. Facilitated uptake of mercury at trace concentrations by *Escherichia coli* and *Vibrio anguillarum*. Workshop on the Fate, Transport, and Transformation of Mercury in Aquatic & Terrestrial Environments. West Palm Beach, FL., May 8-10, 2001.

Lipthay, J.R., J. Aamand, and T. Barkay. Expression of *tfdA* in aquatic microbial communities during degradation of 2,4-dichlorophenoxyacetic acid. 9<sup>th</sup> International Symposium on Microbial Ecology. Amsterdam, The Netherlands, Aug. 26–31, 2001.

J.K. Schaefer, J. Reinfelder, J. Yagi, and T. Barkay. The potential role of *mer*-mediated resistance in controlling methylmercury accumulation in freshwater ecosystems in New Jersey. 102<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Salt Lake City, May 19– 3, 2002, and The 34<sup>th</sup> Mid-Atlantic Industrial & Hazardous Waste Conference, Rutgers University, New Brunswick, NJ, Sept. 20-21, 2002.

Chew Y. S., C. Vetriani, and T. Barkay. Mercury resistance and *merA* sequences of moderately thermophilic and mesophilic bacteria from hydrothermal vents. 102<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Salt Lake City, May 19 – 23, 2002.

Coombs J.M., G. Benyehuda, and T. Barkay. A nested PCR approach to examine the molecular basis of resistance via heavy metal efflux pumps among bacteria of the deep terrestrial subsurface. 102<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Salt Lake City, May 19–23, 2002, and Bioremediation and Biodegradation: Current Advances in Reducing Toxicity, Exposure and Environmental Consequences, Asilomar Conference Center, Pacific Grove, California, June 1 – 12, 2002.

Yagi, J.M., and T. Barkay. Determination of mercuric reductase activity of soil microbial communities. 102<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Salt Lake City, May 19–23, 2002.

Barkay, T., and J. Schaefer. Microbe-mercury interactions: old paradigms, new frontiers. Bioremediation and Biodegradation: Current Advances in Reducing Toxicity, Exposure and Environmental Consequences. Asilomar Conference Center, Pacific Grove, CA, June 9–12, 2002.

Coombs J.M., G. Benyehuda, J. de Liphay, S. Sørensen, and T. Barkay. Lateral gene transfer of genes encoding heavy metal efflux pumps in bacteria of the deep terrestrial subsurface. International Symposium on Subsurface Microbiology, Copenhagen, Denmark, Sept. 8–13, 2002, and The 34<sup>th</sup> Mid-Atlantic Industrial & Hazardous Waste Conference, Rutgers University, New Brunswick, NJ, Sept. 20–21, 2002.

Barkay, T. The role of microbial transformations in controlling methylmercury accumulation in aquatic environments. The 34<sup>th</sup> Mid-Atlantic Industrial & Hazardous Waste Conference, Rutgers University, New Brunswick, NJ, Sept. 20–21, 2002. Invited talk.

Yagi, J., J. Schaefer, J.-C. Bonzongo, K. Duddleston, K. Haase, M. Hines, and T. Barkay. Factors controlling methylmercury production in bank soils of the Carson River, Nevada. 103<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Washington DC, May 18–22, 2003.

Coombs, J.M., and T. Barkay. Lateral transfer of metal homeostasis genes: a comparison between surface bacteria and isolates from the deep terrestrial subsurface. 103<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Washington DC, May 18–22, 2003.

Kaletsky, R., A. Chatziefthimiou, M. Fleming, and T. Barkay. Isolation and initial characterization of novel organomercurial lyases. 103<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Washington DC, May 18–22, 2003.

Chatziefthimiou, A. D., C. Vetriani, and T. Barkay. Isolation and characterization of mercury resistant, thermophilic, thiosulfate-oxidizing bacteria from a hot spring in Mount Amiata, Italy. 104<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. New Orleans, May 19–23, 2004.

Ní Chadhain, S. M., S. Hicks, J. Schaefer, T. Barkay, G. J. Zylstra. Novel mercuric reductase genes found in anaerobic communities of mercury contaminated sediments. 104<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. New Orleans, May 19–23, 2004.

Schaefer, J. K., J. Yagi, T. Cardona-Marek, K. Ellickson, S. Tel-Or, J. Reinfelder, and T. Barkay. The role of the bacterial enzyme, organomercurial lyase, in controlling methylmercury accumulation in mercury contaminated natural waters. 7<sup>th</sup> International Conference on Mercury as a Global Pollutant. Ljubljana, Slovenia, June 27–July 2, 2004.

Kritee K., B. Klaue, T. Barkay, and J.D. Blum. Mercury isotopic fractionation observed during the reduction of Hg(II) to Hg(0) by the bacterial mercuric reductase. 7<sup>th</sup> International Conference on Mercury as a Global Pollutant. Ljubljana, Slovenia, June 27–July 2, 2004.

Crespo-Medina, M. T. Barkay, and C. Vetriani. Mercuric reductase enzymes from mesophilic bacteria are optimally active at a moderately thermophilic to thermophilic temperature range. Extremophiles 2004. 5<sup>th</sup> International Conference on Extremophiles. Cambridge, MD, Sept. 19–23, 2004.

Barkay T, Schaefer, J, Poulain, A. and, Amyot M. Microbial transformations in the mercury geochemical cycle. 15<sup>th</sup> Goldschmidt Conference. Moscow, Idaho, May 20–25, 2005. Invited talk

Kritee, K., B. Klaue, J. Blum, and T. Barkay. Biological mercury (Hg) isotope fractionation. 15<sup>th</sup> Goldschmidt Conference. Moscow, Idaho, May 20 – 25, 2005.

Raimondo, M.A., H.S. Humphrys, J. Coombs, T. Barkay, and P.A. Sobecky. 2005. heavy metal resistance of aerobic subsurface chemoheterotrophs obtained from the field research center, oak Ridge, Tennessee. 105<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Atlanta, June 5–9, 2005

Wiatrowski, H. A., and T. Barkay. A novel mechanism for reduction of mercury (II) by *Shewanella oneidensis* MR-1. 105<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Atlanta, June 5–9, 2005.

Coombs, J., G. Oregaard, I. Torres, C.H. Black, P. Sobecky, and T. Barkay. A functional gene microarray for the detection of a genomic linkage between metal resistance and *inc/rep* genes on broad host Range plasmids. 105<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Atlanta, June 5–9, 2005.

Schaefer, J., and T. Barkay. Diversity of mercuric reductase (MerA) genes and transcripts in mercury contaminated waters. 105<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Atlanta, June 5–9, 2005.

Yu, R., J. K. Schaefer, C. Dipasquale, and T. Barkay. Molecular characterization of bacterial and archaeal communities in a Hg contaminated Adirondack wetland. North East Microbiology, Physiology, and Taxonomy Meeting, Blue Mountain Lake, NY, June 2005.

Barkay, T. Gene transfer in the soil environment. International Union of Microbiological Societies 2005. San Francisco. CA, July 23-28, 2005 - invited

Barkay, T., and J. Coombs. Horizontal gene transfer of metal homeostasis genes and its role in microbial communities of the deep terrestrial subsurface. Society of General Microbiology Symposium on “Micro-organisms in Earth Systems”, Keele, England, Sept. 12–15, 2005 – invited.

Barkay, T., and C. Vetriani. Microbe-mercury interactions in geothermal environments: insights into the evolution and origin of microbial mercury detoxification. Gordon Research Conference on Environmental Bioinorganic Chemistry, Andover, NH, June 18–23, 2006 – invited.

Wiatrowski, H., and T. Barkay. Reduction of Hg(II) to Hg(0) by dissimilatory metal reducing bacteria. 8<sup>th</sup> International Conference on Mercury as a Global Pollutant. Madison, WI, Aug. 11–Aug 16, 2006.

Kritee, K., J. Blum, M. Johnson, B. Berquist, and T. Barkay. The measurement of microbial mercury stable isotope fractionation and its potential utility for distinguishing between Hg sources. 8<sup>th</sup> International Conference on Mercury as a Global Pollutant. Madison, WI, Aug. 11–Aug 16, 2006.

Crespo-Medina, M., N. Bloom, A. Chatziefthimiou, J. Reinfelder, C. Vetriani, and T. Barkay. Interactions of chemosynthetic bacteria with mercury at deep-sea hydrothermal vents. 8<sup>th</sup> International Conference on Mercury as a Global Pollutant. Madison, WI, Aug. 11–Aug 16, 2006.

Yu, R., C. DiPasquale, and T. Barkay. Molecular characterization of microorganisms in a methylmercury producing Adirondack Wetlands. 8<sup>th</sup> International Conference on Mercury as a Global Pollutant. Madison, WI, Aug. 11–Aug 16, 2006.

Crane, S., J. Dighton, and T. Barkay. Interactions between mercury and ectomycorrhizal fungi. 8<sup>th</sup> International Conference on Mercury as a Global Pollutant. Madison, WI, Aug. 11–Aug 16, 2006.

Barkay, T. J. Coombs, and A. Chaziefthimiou. Horizontal gene transfer in microbial communities: Genetic plasticity for coping with environmental change. 4<sup>th</sup> Okazaki Biology Conference on “Terra Microbiology II”, Okazaki, Japan, Sept. 10–15, 2006 – invited.

Øregaard, G., J.R. de Lipthay, T. Barkay, and S.J. Sørensen. High diversity of bacterial mercuric reductase genes from surface and sub-surface soil. 11<sup>th</sup> International Symposium on Microbial Ecology. Viena, Austria, Aug. 20–25, 2006

Wiatrowski, H., Y. Wang, L. Young, and T. Barkay. Reduction of Mercury (II) to Mercury (0) in Anoxic Enrichment Cultures Derived from Subsurface Sediments. 107<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Totonto, May 21–25, 2007

K. Kritee, J. D. Blum, M. W. Johnson, B. A. Bergquist, T. Barkay. Variation In The Extent Of Mercury (Hg) Stable Isotope Fractionation During Reduction Of Hg(II) To Hg(0) By Different Microbial Strains. 107<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Totonto, May 21–25, 2007

Crespo-Medina, M., M. Cuebas, T. Barkay, and C. Vetriani. Isolation and partial characterization of aerobic chemosynthetic thiosulfate oxidizing bacteria from diffuse flow hydrothermal vents from the East Pacific Rise. 107<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Totonto, May 21–25, 2007

Yu, R.-Q., T. Barkay, J. K. Schaefer, C. DiPasquale, I. Adatto, M. E. Hines. Molecular Characterization of Microbial Communities in a Methylmercury-Contaminated Adirondack Lake Wetland. 107<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Totonto, May 21–25, 2007

Crane, S., T. Barkay, and J. Dighton. Growth Responses to and Accumulation of Mercury by Ectomycorrhizal Fungi. 107<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Totonto, May 21–25, 2007

Wang, Y., P. Lu-Irving, D. Krabbenhoft, S. King, and T. Barkay. Relating the Distribution of the Mercuric Reductase Gene (*merA*) to Environmental Gradients in Yellowstone Springs Using

Seven Novel Sets of Degenerate PCR Primers that Cover the Known Diversity of *merA*. 107<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Totonto, May 21–25, 2007

Wang, Y., P. Lu-Irving, Z. Freedman, and T. Barkay. The mercury resistance (*mer*) system of *Thermus thermophilus* HB27 as a model for evolution of microbe-metal interactions in geothermal envrionemnts. 107<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Totonto, May 21–25, 2007

Barkay, T., Y. Wang, P. Lu-Irving, D. Krabbenhoft, S. King, S. Crane, J. Dighton, E. Boyd, and G. Geesey. The effect of environmental conditions on the distribution of the mercuric reductase (*merA*) gene in mercury-enriched acidic and circumneutral hot springs in Yellowstone National Park. Geothermal Biology and Geochemistry in Yellowstone National Park. NSF Research Coordination Network & MAU Thermal Biology Institute 2008 Workshop. Mammoth Hotel, Yellowstone National Park, Wyoming Jan. 10-13, 2008

Freedman, Z. T. Barkay, and G. Geesey. Isoltaion and characterization of early evolving mercury resistant bacteria in Yellowstone National Park. Geothermal Biology and Geochemistry in Yellowstone National Park. NSF Research Coordination Network & MAU Thermal Biology Institute 2008 Workshop. Mammoth Hotel, Yellowstone National Park, Wyoming Jan. 10-13, 2008

Barkay, T. Between a soft metal and a hot place: Mercury microbiology in geothermal environments. 108<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Boston, June 1 – 5, 2008 – invited

Kritee, K., T. Barkay, and J. Blum. Absence of magnetic isotope fractionation for Hg during dark biological processes: experimental evidence and theoretical considerations. Am. Geophys. Union Fall meeting 2008, San Francisco, Dec. 2008 - invited

Barkay, T. and N. Yee. Reduction of Hg in saturated subsurface sediments and its potential to mobilize Hg in its elemental form. 3<sup>rd</sup> DOE-ERSP Annual PI meeting, Washington DC, Apr. 20-23, 2009

Yee, N., H.A. Wiatrowski, S. Das, C.-C. Lin, M. Parikh, R. Kukkadapu, and T. Barkay. Reduction of Hg(II) to Hg(0) by Magnetite. 3<sup>rd</sup> DOE-ERSP Annual PI meeting, Washington DC, Apr. 20-23, 2009

Wang, Y., H.A. Wiatrowski, R. John, P. Lu-Irving, L. Young, L. Kerkhof, and T. Barkay. Impact of mercury on denitrifying microbial communities in subsurface sediments. 109<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Philadelphia, May 17 – 21, 2009

Freedman, Z. T. Barkay, Y. Wang, and G. Geesey. Isolation of Chemoautotrophic Mercury Resistant Bacteria from microbial mats in Yellowstone National Park. 109<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Philadelphia, May 17 – 21, 2009

Yu, R-Q., T. Barkay, R. Turner, J.R. Flanders, and E. Mack. Potentials for Microbial Methylmercury Production in the South River, VA. 109<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Philadelphia, May 17 – 21, 2009

Chatziefthimiou, A.D. A.L. Isola, and T. Barkay. Mercury Contamination and its Effects on Phylogenetic and Functional Diversity of Soil Hg<sup>R</sup> Bacteria. 109<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Philadelphia, May 17 – 21, 2009

Ziogaite, B., B. Smith, A. Chatziefthimiou, T. Barkay, and J. Coombs. Isolation and Microarray Analysis of Cryptic Plasmids from Metal Resistant Bacteria of the Deep Terrestrial Subsurface. 109<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. Philadelphia, May 17 – 21, 2009

Barkay, T., Wang, Y., and S. Crane. Microbial mercury resistance in geothermal springs. Goldschmidt 2009, Davos, Switzerland, June 21 – 26, 2009

Wiatrowski, H. S. Das, R. Kukkadapu, E. Ilton, T. Barkay, and N. Yee. Reduction of Hg(II) to Hg(0) by Magnetite. Goldschmidt 2009, Davos, Switzerland, June 21 – 26, 2009

Yu, R.-Q., M.E. Hines, and T. Barkay. Microbial mercury methylation by syntrophic microbial consortia. 110<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. San-Diego, May 23 – 27, 2010

Barkay, T., A. Møller, A. Poulain, H. Skov, and N. Kroer. Microbial transformations: A missing link in understanding mercury fate and effects in polar regions. International Polar year, Oslo, Norway, June 8-12, 2010

Yee N., Barkay T., Parikh M., Lin C., Wiatrowski H.A., Das S., Biotic/Abiotic Pathways of Hg(II) Reduction by Dissimilatory Iron Reducing Bacteria, Geological Society of America, Baltimore, MAR 2010

Lin C., Wang Y., Wiatrowski H.A., Yee N., Barkay T., Reduction of Mercury(II) to Mercury(0) by Nitrate Enrichment Cultures Established by the Subsurface Sediments from Oak Ridge, TN, Geological Society of America, Baltimore, MAR 2010

Yee N., Parikh M., Lin C., Kukkadapu K., Barkay T., Reduction of Hg(II) to Hg(0) by Biogenic Magnetite, *Geochimica et Cosmochimica Acta* 74: A1184, Suppl.2010

Parikh M., Lin C., Kukkadapu K., Wang Y., Dohnalkova A., Kukkadapu K., Bowden M., Barkay T., Yee. N. Novel iron-reducing bacterium isolated from Oak Ridge TN, *Geochimica et Cosmochimica Acta* 74: A792, Suppl. 2010

Lin C., Wang Y., Wiatrowski H., Yee N., Barkay T. Reduction of Hg(II) to Hg(0) by Nitrate Enrichment Cultures Derived from Subsurface Sediments. *Geochimica et Cosmochimica Acta* 74: A605, Suppl. 2010

Freedman, Z. and T. Barkay. Mer-riment in Hot and Hostile Environments: Interactions of Aquificales with Mercury. 111<sup>th</sup> Annu. Meet. Am. Soc. Microbiol. New Orleans, May 21 – 24, 2011.

Barkay, T. Microbial mercury methylation: historical perspectives, current understandings, and future directions. The 10th International Conference on Mercury as a Global Pollutant (ICMGP), Hlifax, July 24-29, 2011 – Invited talk

Wang, Y., H. Wiatrowski, N. Yee, T. Barkay, and, C.-C Lin. Redox cycling of Hg by dissimilatory nitrate-reducing enrichment cultures. The 10th International Conference on Mercury as a Global Pollutant (ICMGP), Hlifax, July 24-29, 2011

Crane, S., M. Husar, J. Dighton, and T. Barkay. The response of saprotrophic fungi from forest soils to mercury: tolerance and community diversity. The 10th International Conference on Mercury as a Global Pollutant (ICMGP), Hlifax, July 24-29, 2011

Cruz, K., M. Crespo-medina, S. Borin, R. Cruz, C. Vetriani, and T. Barkay. Is there a novel mercury resistance mechanism among chemosynthetic bacteria from deep sea hydrothermal vents? The 10th International Conference on Mercury as a Global Pollutant (ICMGP), Hlifax, July 24-29, 2011

Yu, R.-Q, M. Hines, and T. Barkay. Two pathways for the enhancement of mercury methylation by syntrophic interactions. The 10th International Conference on Mercury as a Global Pollutant (ICMGP), Hlifax, July 24-29, 2011

Barkay, T. The origin, evolution, and distribution of the mercury resistance (*mer*) system in geothermal environments. The 11<sup>th</sup> International Conference on Thermophiles Research. Big Sky, Montana, Sept. 11-16, 2011 – Invited talk

Freedman, Z., and T. Barkay. Mercury resistance among thermophilic Aqificales. The 11<sup>th</sup> International Conference on Thermophiles Research. Big Sky, Montana, Sept. 11-16, 2011

### Graduate Students:

Søren Sørensen	Ph.D. awarded in 1994 by The University of Copenhagen
Janice Kurts	Ph.D. awarded in 1995 by George Mason University
John Danbar	Ph.D. student, Michigan State University, 1994
Lasse Rassmusan	Ph.D. student, The University of Copenhagen, 1996
Jeffra Scheafer	Ph.D. (2005), Rutgers University
Aspa Chatziefthimiou	Ms.C. (2005), Rutgers University
Rachel Ward	Ms.C. (2007), Rutgers University
Kritee	Ph.D. (2008), Rutgers University
Sharron Hicks Crane	Ph.D. (2011), Rutgers University, present
Melitza Crespo-Medina	Ph.D. (2008), Rutgers University
Riqing Yu	Ph.D. (2011), Rutgers University, present
Zac Friedman	Ph.D. student, Rutgers University, present
Aspa Chatziefthimiou	Ph.D. student, Rutgers University, present
Kim Cruz	Ph.D. student, Rutgers University, Present

**Potsdoctoral fellows:**

Dr. Erwan Saouter - 1992 through 1994  
Dr. Sylvie Nazaret - 1992 through 1994  
Dr. Rathi Kavanagh - 1992 through 1994  
Dr. Jarek Letowski – 2000 - 2001  
Dr. Jonna Coombs – 2001 - 2005  
Dr. Heather Wiatrowski – 2003 – 2008  
Dr. Yanping Wang – 2005 – 2010  
Dr. Chu-Ching Lin – 2008 – 2010  
Dr. Riqing Yu – 2011 - present

**Technicians:**

Ms. Cynthia Liebert - 1987 through 1992  
Mr. Mark Gillman - 1989 through 1994  
Ms. Olga Selifonova - 1992 through 1993  
Ms. Shiyeng Zhang - 1991 through 1992  
Ms. Susan Nadig - 1996  
Ms. Ruth Dorn – 2000 through 2001  
Ms. Gili Benyehuda – 2000 through 2002  
Ms. Shoshi Tel-Or – 2001 through 2002  
Ms. Jane Yagi – 2001 through 2003  
Ms. Patricia Lu-Irving – 2005 - 2007