# Loring Nies
# Associate Professor, Civil Engineering
# Purdue University

**RESEARCH GRANTS AND AWARDS RECEIVED**

| Beg. Date | End Date | Sponsor | Topic | Names of PI and Co-PIs |
|---|---|---|---|---|
| 8-94 | 12-97 | NSF<br><br>Pub. b.7. | Anaerobic Biotransformation of Environmental Pollutants by Microbial Coenzymes | Nies, 100% |
| 8-96 | 8-97 | Wabash National Corporation<br>Pub. b.5. | In Situ Bioremediation of Pentachlorophenol | Nies, 100% |
| 1-98 | 12-99 | Wabash National Corporation | In Situ Bioremediation of Pentachlorophenol (continuation) | Nies, 100% |
| 2-97 | 12/98 | NSF | Environmental Engineering Laboratories | Nies, 20% |
| 8/98 | 8/00 | Purdue Research Foundation<br><br>Pub. b.8. | A New Paradigm for Describing the Biodegradation of Aromatic Hydrocarbons | Nies, 100% |
| 7/98 | 12/99 | Showalter Trust<br><br>Pub. b.9. | Catabolic Transformation of Toxic Pollutants by Novel Aromatic Hydrocarbon Biodegrading Bacteria | Nies, 100% |
| 1/00 | 8/01 | Indiana Department of Transportation through the Joint Transportation Research Program | Assisted Implementation of Bioremediation at INDOT Facilities | Nies, 100% |
| 8/01 | 7/03 | EPA | Bioremediation of MTBE | Nies (PI), LS Lee, PSCR Rao |
| 2/02 | 1/05 | Joint Transportation Research Program | Wastewater Toxicity Testing of Wash Water from Deicing Trucks | Nies (co-PI), Alleman |
| 8/02 | 7/05 | EPA | Anaerobic Microbial Reductive Debromination of Polybrominated Diphenyl Ethers | Nies (PI), Filley |
| 1/03 | 12/04 | NSF | The Future Role of Ecological Engineering Science in Undergraduate Engineering Education | Nies (PI), Hua, Helgesen, Mohtar, Stuart |
| 11/02 | 4/04 | EPA | *In Situ* Sediment Remediation with Zero Valent Iron | Nies (co-PI), Jafvert |

| | | | | |
|---|---|---|---|---|
| 6/03 | 5/06 | NSF | Molecular Genetic Characterization of Contaminated Environments as a Tool for the Assessment of Remediation Technology | Nies (PI), Nakatsu |
| 7/03 | 6/05 | EPA | Long-term Economical Treatment and Management of PCBs in Soils & Sediments: Laboratory Studies | Nies (co-PI), Lee, Nakatsu |

**Conference Poster Presentations**

1. Nies, L., P. J. Anid, and T.M. Vogel. "Anaerobic-Aerobic Degradation of Polychlorinated Biphenyls (PCBs)." *Gordon Research Conference*, New London, NH, July 1989. Poster.

2. Anid, P.J., L Nies, and T.M. Vogel. "Anaerobic-Aerobic Degradation of Polychlorinated Biphenyls in the Hudson River Laboratory Model." *Battelle International Symposium: In Situ and On-Site Bioreclamation*. San Diego, March 19-21, 1991. Poster.

3. Nies, L., and T. M. Vogel. "Effect of Substrate Concentration on the Rate of Microbial Reductive Dechlorination of PCBs." *91st Annual Meeting of the American Society for Microbiology*. Dallas, TX. May 5-9, 1991. Abstract and Poster.

4. Nies, L., N. Assaf-Anid, and T. M. Vogel. "Reductive Dechlorination of Chlorinated Aromatics by Vitamin $B_{12}$." *Five-Center On-Site Bioremediation Conference*, Kellogg Biological Station, Hickory Corners, MI. May 19-22, 1991. Poster.

5. Nies, L., and T. M. Vogel. "Environmental Factors Affecting Reductive Dechlorination of Chlorinated Aromatics by Microorganisms or Vitamin $B_{12}$." *92nd Annual Meeting of the American Society for Microbiology*. New Orleans, LA. May 26-30, 1992. Abstract and Poster.

6. Nies, L., L. M. Lee, and T. M. Vogel. "Reductive Dechlorination of Polychlorinated Aromatics by Vitamin $B_{12}$." *Gordon Research Conference*. Environmental Science, June 15-19, 1992. New Hampton, NH. Poster.

7. Vogel, T.M., L. Nies and P.J. Anid. "Bioremediation of PCB Contaminated Sediment." *Battelle International Symposium: In Situ and On-Site Bioreclamation*. San Diego, April 5-8, 1993. Poster.

8. Roane, J.E. and L. Nies. "Reductive Dechlorination of Polychlorinated Biphenyls in Non-Acclimated Sediments." *94th Annual Meeting of the American Society for Microbiology*. Las Vegas, NV. May 23-27, 1994. Abstract and Poster.

9. Frisbie, A. and L. Nies. "Characterization of Pentachlorophenol Degradation at an Industrial Site." *Midwest Environmental Chemistry Workshop*, Columbus, OH. October 7-8, 1995. Poster.

10. Leng, J. and L. Nies. "Chemical Methylation of Inorganic Mercury by the Microbial Coenzyme Vitamin $B_{12}$." *Midwest Environmental Chemistry Workshop*, Columbus, OH. October 7-8, 1995. Poster.

11. Mesarch, M. and L. Nies. "Bench Scale Biotreatment Study of Fuel Contaminated Soils." *Midwest Environmental Chemistry Workshop*, Columbus, OH. October 7-8, 1995. Poster.

12. Bargalló, A. and L. Nies. "Characterization of a Novel Aromatic Hydrocarbon Degrading Bacterium." *Midwest Environmental Chemistry Workshop*, Columbus, OH. October 7-8, 1995. Poster.

13. Holden, R.W. II, R.B. Jacko, and L. Nies. "Oxidation Reduction Potential in the Control of the Reductive Dehalogenation of Tetrachloroethylene." *Environmental Science and Engineering Environmental Workshop*, Purdue University, W. Lafayette, IN. October 16, 1997. Poster.

14. Mesarch, M.B., C. Nakatsu, and L. Nies. "Use of Polymerase Chain Reaction (PCR) to Measure Aerobic Bioremediation Potential in Aromatic Hydrocarbon-Contaminated Soils." *Environmental Science and Engineering Environmental Workshop*, Purdue University, W. Lafayette, IN. October 16, 1997. Poster.

15. Baldwin B. R., M. B. Mesarch, P. A. Bonus, and L. Nies. "Hierarchy of Aromatic Hydrocarbon Biodegradation." *Environmental Science and Engineering Environmental Workshop*, Purdue University, W. Lafayette, IN. October 16, 1997. Poster.

16. Frisbie, A. J. and L. Nies. "Pentachlorophenol Biodegradation in Contaminated Soils." *Environmental Science and Engineering Environmental Workshop*, Purdue University, W. Lafayette, IN. October 16, 1997. Poster.

17. Ridgway, R. M. and L. Nies. "Anaerobic Reductive Dehalogenation of Chlorinated Organics." *Environmental Science and Engineering Environmental Workshop*, Purdue University, W. Lafayette, IN. October 16, 1997. Poster.

18. J. Leng and L. Nies. "Relationship between Anaerobic Biomethylation of Mercury and Anaerobic Reductive Dechlorination." *Environmental Science and Engineering Environmental Workshop*, Purdue University, W. Lafayette, IN. October 16, 1997. Poster.

19. Mesarch, M.B., C. H. Nakatsu, and L. Nies. "Molecular Techniques for Assessing and Monitoring Bioremediation Activity in Soils Contaminated by Petroleum Hydrocarbons." *Eighth International Symposium on Microbial Ecology*, Halifax, Nova Scotia, August 1998. Poster.

20. Mesarch, M.B., C. H. Nakatsu, and L. Nies. "Quantification of Catechol 2,3-Dioxygenase Genes." *Joint United States -European Union Theoretical and Practical Course on Molecular Approaches for in situ Biodegradation*. Cook College, Rutgers University. New Brunswick, New Jersey, June 1998. Poster.

21. Mesarch, M.B., C. H. Nakatsu, and L. Nies. "Use of the Polymerase Chain Reaction (PCR) to Measure Aerobic Bioremedation Potential of Aromatic Hydrocarbon-Contaminated Soils." *Environmental Sciences and Engineering Institute Symposium*, Purdue University, West Lafayette, Indiana, September 24, 1998. Poster.

22. Baldwin, B.B. and L. Nies. "Interactions with Multiple Aromatic Substrates." *Environmental Sciences and Engineering Institute Symposium*, Purdue University, West Lafayette, Indiana, September 24, 1998. Poster.

23. Mesarch, M., C. Nakatsu, and L. Nies. 1999. "Quantification of Catechol 2,3-Dioxygenase Genes for Monitoring Bioremediation." *In Situ and On-Site Bioremediation* , San Diego, CA, April 19-22, 1999. Abstract and Poster.

24. Baldwin, B. R., C. H. Nakatsu, and L. Nies. Detecting aromatic catabolic genes by PCR amplification. Environmental Science and Engineering Symposium, May 1999. West Lafayette, Indiana. Abstract and Poster.

25. Mesarch, M., C. Nakatsu, and L. Nies. 1999. "Quantification of Aromatic Hydrocarbon-Degrading Bacteria Using a Competitve PCR Technique." *99th Annual Meeting of the American Society for Microbiology*. Chicago, IL. May 30 - June 3, 1999. Abstract and Poster.

26. Baldwin, B. R., C. H. Nakatsu, and L. Nies. Detection and enumeration of aromatic oxygenase genes by multiplex and real-time PCR. Bioremediation and Biodegradation: Current Advances in Reducing Toxicity, Exposure, and Environmental Consequences, June 9-12, 2002. Pacific Grove, California. Abstract and Poster.

27. Baldwin, B. R., C. H. Nakatsu, and L. Nies. Detection and enumeration of aromatic oxygenase genes by multiplex and real-time PCR. Midwestern States Risk Assessment Symposium, July 24-25, 2002. Indianapolis, Indiana. Abstract and Poster.

28. T.B Xu, L.S.Lee, P.S.C.Rao, C.G. Enfield, L. Nies. In-situ Oxygen Sensors for Use in Biotreatment of Fuel Oxygenates in Groundwater. Division A-5 (Environmental Quality), Session 2, poster number: 331. ASA, CSSA, and SSSA Annual Meeting, Indianapolis, IN. November 10-14, 2002

29. Nies, L., B. R. Baldwin, C. H. Nakatsu, and J. T. Simonds. Molecular genetic detection and enumeration of aromatic oxygenase genes at gasoline-contaminated sites. In Situ and On-Site Bioremediation Symposium, June 2-5, 2003. Orlando, Florida. Abstract.

30. Nebbe, J. L., B. R. Baldwin, C.H. Nakatsu, and L. Nies. Enumeration of aromatic oxygenase genes at petroleum-impacted sites undergoing MNA and enhanced bioremediation. 10th International Symposium on Microbial Ecology, August 22-27, 2004. Cancun, Mexico. Abstract and Poster.

31. Nies, L. "Transition to Renewable Energy." Climate Change Education and Research at Purdue. *Purdue University Climate Change research Center*, W. Lafayette, IN. Novemebr 19, 2004. Poster Presentation.

32. Nebbe, J. L., B. R. Baldwin, L. Nies, and C. H. Nakatsu. Enumeration of Aromatic Oxygenase Genes in Contaminated Gasoline Sites. American Society for Microbiology, 105th General Meeting, June 5-9, 2005. Atlanta, Georgia. Abstract and Poster.

33. Sutton, B. D., J. Nebbe, B. R. Baldwin, C. H. Nakatsu, and L. Nies. Validation of a Real-Time PCR Method for Assessing Biodegradation of Aromatic Hydrocarbon-Contaminated Systems. In Situ and On-Site Bioremediation Symposium, June 6-9, 2005. Baltimore, Maryland. Abstract and Poster.

**b. Commercialization of Technology and Patents**

Detection and Quantification of Aromatic Oxygenase Genes by Real-Time PCR. (with Baldwin and Nakatsu) Purdue Reference No. P-02025.00.US. Serial/Patent No. 60/392,360. Licensed by Microbial Insights, Inc, Rockford, TN

Cosolvent Enhanced Zero Valent Metals Dechlorination of Polychlorinated Biphenyls. (with L. Lee, T. Seager, T. Xu, I. Hua) Provisional patent application.