

DAVID ALLAN STAHL

Education

University of Washington, Seattle; BS magna cum laude, 1971; Microbiology
University of Illinois, Urbana; MS, 1975; Microbiology
University of Illinois, Urbana; PhD, 1978; Microbiology

Research and Professional Experience

- 2000- Professor, Department of Civil and Environmental Engineering, University of Washington
- 1996-00 Professor, Department of Civil Engineering, Northwestern University
- 1998-99 Scientist in Residence, DuPont CR&D, Wilmington, DE
- 1994-96 Associate Professor, Department of Civil Engineering, Northwestern University
Interdepartmental Biology Program (IBIS) Faculty
Center for Biotechnology Student Mentor
- 1991-94 Associate Professor, Department of Veterinary Pathobiology, University of Illinois
Joint Appointment, Department of Civil Engineering
Joint Appointment, Department of Microbiology
- 1984-91 Assistant Professor, Department of Veterinary Pathobiology, University of Illinois, Urbana. Research: Microbial ecology, evolution and phylogeny of microorganisms.
Joint Appointment, Department of Microbiology
- 1980-84 Senior Research Associate, National Jewish Hospital and Research Center, Denver. Research: Ribosomal RNA processing, molecular phylogeny of microorganisms, molecular approaches to microbial ecology.
- 1978-80 NIH Postdoctoral Fellow with Norman Pace. National Jewish Hospital and Research Center, Denver. Research: Nucleic acid structure and ribosomal RNA processing.
- 1974-77 Graduate studies in microbiology with Carl R. Woese, University of Illinois, Urbana. Research: Structure and evolution of the 23S ribosomal RNA.
- 1973-74 Teaching assistant in microbiology and biology, University of Illinois School of Life Sciences. Research: Molecular phylogeny.
- 1971-73 University of Illinois predoctoral fellowship: Department of Microbiology.

Professional Interests

General Microbial Ecology: Microbially catalyzed sulfur and metal cycling, microbial ecology and enzymology of plant fiber depolymerization, competition and syntrophy among anaerobes.

Applied Microbial Ecology: Bioremediation, anaerobic microbial transformation of aromatic and chlorinated pollutants, nitrification, structure and activity of biofilms, microbially influenced corrosion.

Microbial Evolution and Systematics: Phylogeny inference, comparative sequencing, and comparative physiology.

Educational Activities

Current teaching: Water Microbiology, Microbial Ecology, Bioremediation

University of Minnesota Malcolm Moos Visiting Professorship. Applications of molecular techniques to studies of microbial ecology (1987-1989, 1992)

Workshops, Service, and Honors

Board of Governors, American Academy of Microbiology. 2001-

Committee on the Origins and Evolution of Life. National Research Council. 2000-

James N. and Margie M. Krebs Professor (Northwestern University)

1999 Bergey Award

Fellow American Academy of Microbiology, Elected 1996.

National Research Council Task Group on Forward Contamination of Europa. 1999-2000.

Orton K. Stark Distinguished Lecturer, Miami University, April 1998.

NASA, Mars Curation and Receiving Oversight Panel. 1997-1998

USFCC/J. Roger Porter Award Committee. 1998-1999, 2002-

ASM Foundation for Microbiology Lecturer, 1997-1999.

Smith Kline Beecham Award for Research Excellence, 1992.

American Academy of Microbiology colloquium "Food Safety: Current Status and Future Needs" Nashville, Tennessee. August 14-16, 1998.

United Kingdom Chemical and Biological Defense Sector. United Kingdom, USA, Canada, and Australia - joint workshop entitled "Characterization of Ambient Bioaerosols". Porton Down, Salisbury, UK. February 26-27, 1997.

American Society for Microbiology colloquium of leading scientists "The Microbial World: Foundation of the Biosphere" Agenda: to define key issues relating to microbial diversity and to develop an action plan. Florida., January 1996.

German Ministry for Research and Technology and the German National Research Center for Biotechnology Workshop on Molecular Microbial Ecology and Biosafety. Wolfenbüttel, Germany, June, 1994.

American Academy of Microbiology Colloquium on Strategies and Mechanisms for Field Research in Environmental Bioremediation, San Antonio, TX, January 8-10, 1993.

Marine Sediment Biogeochemistry Workshop. Sponsored by the Office of Naval Research in Association with the Federation of American Societies for Experimental Biology. Washington, D.C., May 26-28, 1993.

University of Illinois Beckman Research Award Recipient, 1992

University of Illinois, Department of Veterinary Pathobiology, Norman and Helen Levine Award for Research Excellence, 1991

Chair-elect of Division R (Systematic and Evolutionary Microbiology). American Society for Microbiology, one-year term beginning July 1, 1990.

University of Minnesota Malcolm Moos Visiting Professorship. Instruction of workshops (July 1987-1989, 1992) at the Gray Freshwater Biological Institute on the applications of molecular techniques to studies of microbial ecology.

Invited Division I Lecturer (General Microbiology) Annual Meeting of the American Society for Microbiology, Dallas, May 5-9, 1991.

Membership on the Biotechnology Science Advisory Committee for the U.S. Environmental Protection Agency, 1986-1989.

Editorial Posts

Founding Co-Editor: Environmental Microbiology, 1998 - present

Editor: Molecular and Microbiological Reviews, 1998 - present

Editor: Biodegradation, 1997 - present

Editor: FEMS Microbiology Letters, 1990 - 1996

Editorial Board: Journal of Bacteriology 1991 - 1999

Editorial Board: Systematic and Applied Microbiology, 1992 - present

Editorial Board: Microbial Ecology, 1993 - present

Editorial Board: Molecular Ecology, 1995 - 1999

Societies and Professional Organizations

Fellow American Academy of Microbiology

American Society for Microbiology

Sigma Xi

Publications

1. Doolittle, W.F., C.R. Woese, M.L. Sogin, L. Bonen, and D. Stahl. Sequence studies on 16S ribosomal RNA from a blue-green alga. *J. Mol. Evol.* **4**: 307-315 (1975).
2. Woese, C.R., G.E. Fox, L. Zablen, T. Uchida, L. Bonen, K. Pechman, B.J. Lewis, and D. Stahl. Conservation of primary structure in 16S ribosomal RNA. *Nature* **254**: 83-86 (1975).
3. Magrum, L., L. Zablen, D. Stahl, and C. Woese. Corrections in the catalogue of oligonucleotides produced by digestion of *Escherichia coli* 16S rRNA with T1 RNase. *Nature* **257**: 423-426 (1975).
4. Woese, C., M. Sogin, D. Stahl, B.J. Lewis, and L. Bonen. A comparison of the 16S ribosomal RNAs from mesophilic and thermophilic bacilli: Some modifications in the Sanger method for RNA sequencing. *J. Mol. Evol.* **7**: 197-213 (1976).
5. Stahl, D.A. Structure and evolution of the prokaryotic 23S ribosomal RNA. PhD Thesis, University of Illinois (1978).
6. Stahl, D.A., T.A. Walker, B. Meyhack, and N.R. Pace. Precursor-specific nucleotide sequences can govern RNA folding. *Cell* **18**: 1133-1143 (1979).
7. Woese, C.R., L.J. Magrum, R. Gupta, R.B. Siegel, D.A. Stahl, J. Kop, N. Crawford, J. Brosius, R. Gutell, J. J. Hogan, and H. F. Noller. Secondary structure model for bacterial 16S ribosomal RNA: Phylogenetic, enzymatic, and chemical evidence. *Nucleic Acids Res.* **8**: 2275-2293 (1980).
8. Fox, G.E., E. Stackebrandt, R.B. Hespell, J. Gibson, J. Maniloff, T.A. Dyer, R.S. Wolfe, W.E. Balch, R.S. Tanner, L.J. Magrum, L.B. Zablen, R. Blakemore, R. Gupta, L. Bonen, B.J. Lewis, D.A. Stahl, K.R. Leuhrsen, K.N. Chen, and C.R. Woese. The phylogeny of prokaryotes. *Science* **209**: 457-463 (1980).
9. Stahl, D.A., B. Meyhack, and N.R. Pace. Recognition of local nucleotide conformation in contrast to sequence by a rRNA processing endonuclease. *Proc. Natl. Acad. Sci. USA*, **77**: 5644-5648 (1980).
10. Stahl, D.A., K.R. Luehrsen, C.R. Woese, and N.R. Pace. An unusual 5S rRNA from *Sulfolobus acidocaldarius* and its implications for a general 5S rRNA structure. *Nucleic Acids Res.* **9**: 6129-2137 (1981).
11. Noller, H.F., J. Kop, V. Wheaton, J. Brosius, R.R. Gutell, A.M. Kopylov, F. Dohme, W. Herr, D.A. Stahl, R. Gupta, and C.R. Woese. Secondary structure model for 23S ribosomal RNA. *Nucleic Acids Res.* **9**: 6167-6189 (1981).
12. Pace, N.R., K. Gardiner, B. Meyhack, B. Pace, M.L. Sogin, and D.A. Stahl. Processing *In: Bacillus subtilis*. In: *Microbiology 1982*, Schlessinger, D. (ed.), American Society for Microbiology, Washington, D.C. (1982).
13. Stahl, D.A., B. Pace, T. Marsh, and N.R. Pace. The ribonucleoprotein substrate for a ribosomal RNA processing nuclease. *J. Biol. Chem.* **259**: 11448-11453 (1984).

14. Pace, B., D.A. Stahl, and N.R. Pace. The catalytic element of a ribosomal RNA processing complex. *J. Biol. Chem.* **259**: 11454-11458 (1984).
15. Stahl, D.A., D.J. Lane, G.J. Olsen, and N.R. Pace. Analysis of hydrothermal vent-associated symbionts by ribosomal RNA sequences. *Science* **224**: 409-411 (1984).
16. Rogers, M.J., J. Simmons, R.T. Walker, W.G. Weisburg, C.R. Woese, R.S. Tanner, I.M. Robinson, D.A. Stahl, G. Olsen, R.H. Leach, and J. Maniloff. Construction of the mycoplasma evolutionary tree from 5S rRNA sequence data. *Proc. Natl. Acad. Sci. USA* **82**: 1160-1164 (1985).
17. Pace, N.R., D.A. Stahl, D.J. Lane, and G.J. Olsen. Analyzing of natural microbial populations by RNA sequences. *ASM News* **51**: 4-12 (1985).
18. Lane, D.J., D.A. Stahl, G.J. Olsen, and N.R. Pace. Analysis of hydrothermal vent-associated symbionts by ribosomal RNA sequences. *Bulletin of the Biological Society of Washington*, No. **6**: 389-400 (1985).
19. Stahl, D.A., D.J. Lane, G.J. Olsen, and N.R. Pace. Characterization of a Yellowstone hot spring microbial community by 5S rRNA sequences. *Appl. Environ. Microbiol.* **49**: 1379-1384 (1985).
20. Lane, D.J., D.A. Stahl, G.J. Olsen, D. Heller, and N.R. Pace. Phylogenetic analysis of the genus *Thiobacillus* and *Thiomicrospira* by 5S rRNA sequences. *J. Bacteriol.* **163**: 75- 81 (1985).
21. Pierson, B.K., S.J. Giovannoni, D.A. Stahl, and R.W. Castenholz. *Heliothrix oregonensis*, gen. nov., sp. nov., a phototrophic filamentous gliding bacterium containing bacteriochlorophyll a. *Arch. Microbiol.* **142**: 164-167 (1985).
22. Lane, D.J., B. Pace, G.J. Olsen, D.A. Stahl, M.L. Sogin, and N.R. Pace. Rapid determination of 16S ribosomal RNA sequences for phylogenetic analyses. *Proc. Natl. Acad. Sci. USA* **82**: 6955-6959 (1985).
23. Stahl, D.A. Evolution, ecology and diagnosis: Unity in variety. *Bio/Technology* **4**: 623-628 (1986).
24. Pace, N.R., D.A. Stahl, D.J. Lane, G.J. Olsen. The analysis of natural microbial populations by ribosomal RNA sequences. *Adv. Microbial Ecol.*, Vol. 9, K. C. Marshall (ed.), Plenum Press, pp. 1-55 (1986).
25. Olsen, G.J., D.J. Lane, S.J. Giovannoni, N.R. Pace, and D.A. Stahl. Microbial ecology and evolution: A ribosomal RNA approach. *Ann. Rev. Microbiol.* **40**: 337-365 (1986).
26. Pace, N.R., D.J. Lane, G.J. Olsen, and D.A. Stahl. Phylogenetic analysis of organisms and populations using ribosomal RNA sequences. In: Megusar and Guntar (Eds.) *Perspectives in Microbial Ecology*. (1986).
27. Stahl, D.A., D.J. Lane, G.J. Olsen, D.J. Heller, T.M. Schmidt, and N.R. Pace. A phylogenetic analysis of certain sulfide-oxidizing and related morphologically conspicuous bacteria by 5S ribosomal RNA sequence. *Int. J. Syst. Bacteriol.* **37**: 116-122 (1987).

28. Romaniuk, P.J., B. Zoltowska, T.J. Trust, D.J. Lane, G.J. Olsen, N.R. Pace, and D.A. Stahl. *Campylobacter pyloridis*: The spiral bacterium associated with human gastritis is not a true *Campylobacter*. *J. Bacteriol.* **169**: 2137-2141 (1987).
29. Allison, M.J., H.M. Cook, and D.A. Stahl. Characterization of rumen bacteria that degrade dihydroxypyridine compounds produced from mimosine. In: Rose, M. (Ed.) *Herbivores Nutrition Research*. Australian Society for Animal Protection, Brisbane, Australia, pp. 55-56 (1987).
30. Stahl, D.A., B. Flesher, H.R. Mansfield, and L. Montgomery. The use of phylogenetically based hybridization probes for studies of ruminal microbial ecology. *Appl. Environ. Microbiol.* **54**: 1079-1084 (1988).
31. Stahl, D.A. Phylogenetically-based studies of microbial ecosystem perturbations. In: Hedin, P., J.J. Menn, and R.M. Hollingworth (Eds.) *American Chemical Society Symposium Volume: Biotechnology for Crop Protection*, American Chemical Society, Washington, D.C., pp. 373-390 (1988).
32. Distell, D.L., D.J. Lane, G.J. Olsen, S.J. Giovannoni, B. Pace, N.R. Pace, D.A. Stahl, and H. Felbeck. Sulfur-oxidizing bacterial endosymbionts: Analysis of phylogeny and specificity by 16S rRNA sequences. *J. Bacteriol.* **170**: 2506-2510 (1988).
33. Montgomery, L., B. Flesher, H.R. Mansfield, and D.A. Stahl. Transfer of *Bacteroides succinogenes* to *Fibrobacter* gen. nov. as *Fibrobacter succinogenes* comb. nov. and *Fibrobacter intestinalis* sp. nov. *Int. J. Syst. Bacteriol.* **38**: 430-435 (1988).
34. Hofle, M.G., D.A. Stahl, G. Sayler, R.M. Atlas, G.F. Barry, G. Muyzer, R.J. Steffan, and D.E. Stewart-Tull. Detection methods including sequencing and probes. In: Sussman, N., C.H Collins, F.A., Skinner, and D.E. Stewart-Tull (Eds.) *The Release of Genetically Engineered Microorganisms*, Academic Press, London, pp. 207-230 (1988).
35. Stahl, D.A., G. Krupp, and E. Stackebrandt. RNA sequencing. In: *Practical approach series nucleic acids sequencing*. Howe, C.J., and E.S. Ward (eds), IRL Press, Oxford, Washington, D.C., pp. 137-183 (1989).
36. Breen, A., D.A. Stahl, B. Flesher, and G. Sayler. Characterization of *Pseudomonas geomorphus*: A Novel Groundwater Bacterium. *Microbial Ecology* **18**: 221-233 (1989).
37. Devereux, R., M. Delaney, and D.A. Stahl. Natural relationships among sulfate-reducing bacteria. *J. Bacteriol.* **171**: 6689-6695 (1989).
38. Stahl, D.A., R. Devereux, R.I. Amann, B. Flesher, C. Lin, and J. Stromley. Ribosomal RNA based studies of natural microbial diversity and ecology. In: *Recent Advances in Microbial Ecology*. Hattoir, Y., Y. Ishida, Y. Maruyama, R.Y. Morita, and A. Uchida (eds.), *Proceedings of the 5th International Symposium on Microbial Ecology*, pp. 669-673 (1989).
39. Walch, M, W.A. Hamilton, P.S. Handley, N.C. Holm, J.G. Kuenen, N.P. Revsbech, M.A. Rubio, D.A. Stahl, O. Wanner, D.M. Ward, P.A. Wilder, and J.W.T. Wimpenny. Spatial distribution of biotic and abiotic components in the biofilm. In: *Structure and Function of Biofilms*. Characklis, W.G., and P.A. Wilderer (eds.), John Wiley and Sons, pp. 165-190 (1989).

40. Stahl, D.A., and J.W. Urbance. The division between fast- and slow-growing species corresponds to natural relationships among the mycobacteria. *J. Bacteriol.* **172**: 116-124 (1990).
41. Rittmann, B.E., B.F. Smets, and D.A. Stahl. The role of genes in biological processes. Part I. *Environ. Sci. Technol.* **24**: 23-29 (1990).
42. Smets, B.F., B.E. Rittmann, and D.A. Stahl. The role of genes in biological processes. Part II. *Environ. Sci. Technol.* **24**: 162-169 (1990).
43. Amann, R., L. Krumholz, and D.A. Stahl. Fluorescent DNA probing of whole cells for determinative, phylogenetic and environmental studies in microbiology. *J. Bacteriol.* **172**: 762-770 (1990).
44. Devereux, R., S-H He, C.L. Doyle, S. Orkland, D.A. Stahl, J. LeGall, and W.B. Whitman. Diversity and origin of *Desulfovibrio* species: Phylogenetic definition of a family. *J. Bacteriol.* **172**: 3609-3619 (1990).
45. Amann, R.I., B. Binder, S.W. Chisholm, R. Olsen, R. Devereux, and D.A. Stahl. Combination of phylogenetically based fluorescent hybridization probes and flow cytometry. *Appl. Environ. Microbiol.* **56**: 1619-1625 (1990).
46. Stahl, D.A. and R. Amann. Development and application of nucleic acid probes in bacterial systematics. *In: Sequencing and Hybridization Techniques in Bacterial Systematics.* Stackebrandt, E., and M. Goodfellow (eds.), John Wiley and Sons, Chichester, England, pp. 205-248 (1991).
47. Dore, J., and D. A. Stahl. Phylogeny of anaerobic rumen Chytridiomycetes inferred from small subunit ribosomal RNA sequence comparisons. *Can. J. Bot.* **69**: 1964-1971 (1991).
48. Lane, D.J., A.P. Harrison, Jr., D.A. Stahl, B. Pace, S.J. Giovannoni, G.J. Olsen, and N.R. Pace. Evolutionary relationships among sulfur- and iron-oxidizing eubacteria. *J. Bacteriol.* **174**: 269-278 (1992).
49. Amann, R.I., Devereux, R., Stromley, J., Key, R., and Stahl, D.A. Molecular and microscopic identification of sulfate-reducing bacteria in multispecies biofilms. *Appl. Environ. Microbiol.* **58**: 614-623 (1992).
50. Amann, T.I., C. Lin, R. Key, L. Montgomery, and D.A. Stahl. Diversity among *Fibrobacter* isolates: Towards a phylogenetic classification. *Syst. Appl. Microbiol.* **15**: 23-31 (1992).
51. Stahl, D.A., R. Key, B. Flesher, and J. Smit. The phylogeny of marine and freshwater caulobacters reflects their habitat. *J. Bacteriol.* **174**: 2193-2198 (1992).
52. Hicks, R.E., R.I. Amann, and D.A. Stahl. Dual staining of natural bacterioplankton with DAPI and fluorescent oligonucleotide probes targeting kingdom-level 16S rRNA sequences. *Appl. Environ. Microbiol.* **58**: 2158-2163 (1992).
53. Stahl, D.A., M. Kane, R. Amann, L. Raskin, R. Key, and J. Stromley. Molecular studies of the population ecology of methanogens and sulfate-reducing bacteria in natural and laboratory systems. *Aust. Microbiologist* **13**: 95-97 (1992).

54. Stahl, D.A., and M.D. Kane. Methods of Microbial Identification, Tracking and Monitoring of Function. *Current Opinion in Biotechnology* **3**: 244-252 (1992).
55. Amann, R.I., B. Zarda, D.A. Stahl, and K-H. Schleifer. Identification of individual prokaryotic cells with enzyme-labeled, rRNA-targeted oligonucleotide probes. *Appl. Environ. Microbiol.* **58**: 3007-3011 (1992).
56. Devereux, R., J. Winfrey, M. Kane, and D. A. Stahl. 16S rRNA hybridization probes to describe natural communities of sulfate-reducing bacteria. *Syst. Appl. Microbiol.* **15**: 601-609 (1993).
57. Allison M.J., W.R. Mayberry, C.S. McSweeney, and D.A. Stahl. *Synergistes jonesii* gen. nov., sp. nov.: A rumen bacteria that degrades pyridinediols. *Syst. Appl. Microbiol.* **15**: 522-529 (1993).
58. Kane, M.D., L.K. Poulsen, and D.A. Stahl. Monitoring the enrichment and isolation of sulfate-reducing bacteria by using oligonucleotide probes designed from environmentally-derived 16S rRNA sequences. *Appl. Environ. Microbiol.* **59**: 682-686 (1993).
59. Krumholz, L.R., M.P. Bryant, W.J. Brulla, J.L. Vicini, J.H. Clark, and D.A. Stahl. Proposal of *Quinella ovalis* gen. nov., sp. nov., based on phylogenetic analysis. *Int. J. Syst. Bacteriol.* **43**: 293-296 (1993).
60. Poulsen, L.K., G. Ballard, and D.A. Stahl. Use of rRNA fluorescence in situ hybridization for measuring the activity of single cells in early and established biofilms. *Appl. Environ. Microbiol.* **59**: 1354-1360 (1993).
61. Devereux, D. and Stahl, D.A. Phylogeny of sulfate-reducing bacteria and a perspective for analyzing their natural communities. In: *Sulfate-reducing bacteria: A contemporary perspective*. R. Singleton Jr. and J.M. Odom, (Eds.), Springer-Verlag, New York and Sci Tech, Madison, pp. 131-160 (1993).
62. McSweeney, C.S., R.I. Mackie, A.A. Odenyo, and D.A. Stahl. Development of an oligonucleotide probe targeting 16S rRNA and its application for detection and quantitation of the ruminal bacterium *Synergistes jonesii* in a mixed-population chemostat. *Appl. Environ. Microbiol.* **59**: 1607-1612 (1993).
63. Stahl, D.A. Comparison of nucleic acids from microorganisms: Sequencing approaches. *In* *Molecular evolution: Producing the biochemical data*. Volume 224 of *Methods in Enzymology*. Zimmer, E.A., T.J. White, R.L. Cann and A.C. Wilson (eds.). Academic Press, Inc., Orlando, Florida (1993).
64. Davey, M.E., W.A. Wood, R. Key, K. Nakamura, and D.A. Stahl. *Geotoga* and *Petrotoga*: Two new genera representing a new lineage in the bacterial line of descent. distantly related to the *Thermotogales* *Syst. Appl. Microbiol.* **16**: 191-200 (1993).
65. Smets, B.F., B.E. Rittmann, and D.A. Stahl. The specific growth rate of *Pseudomonas putida* PAW1 influences the conjugal transfer rate of the TOL plasmid. *Appl. Environ. Microbiol.* **59**: 3430-3437 (1993).
66. Stahl, D.A. The natural history of microorganisms. *ASM News.* **59**: 609-613 (1993)

67. Cornick, N.A., N.S. Jensen, D.A. Stahl, P.A. Hartman, and M.J. Allison. *Lachnospira pectinoschiza* sp. nov.: An anaerobic pectinophile from the pig intestine. *Int. J. Syst. Bacteriol.* **44**: 87-93 (1994).
68. Raskin, L., J.M. Stromley, B.E. Rittmann, and D.A. Stahl. Group-specific 16S rRNA hybridization probes to describe natural communities of methanogens. *Appl. Environ. Microbiol.* **60**: 1232-1240 (1994).
69. Raskin, L., L.K. Poulsen, D.R. Noguera, B.E. Rittmann, and D.A. Stahl. Quantification of methanogenic groups in anaerobic biological reactors using oligonucleotide probe hybridizations. *Appl. Environ. Microbiol.* **60**: 1241-1248 (1994).
70. Korhring, L.L., D.B. Ringelberg, R. Devereux, D.A. Stahl, M. Mittelman, and D.C. White. Comparison of phylogenetic relationships based on phospholipid fatty acid profiles and ribosomal RNA sequence similarities among dissimilatory sulfate-reducing bacteria. *FEMS Micro. Lett.* **119**: 303-308 (1994)
71. Rittmann, B.E., J.M. Regan, and D.A. Stahl. Nitrification as a source of soluble organic substrate in biological treatment. *Water Sci. Technol.* **30**: 1-8 (1994).
72. Lin, C., B. Flesher, W.C. Capman, R.I. Amann, and D.A. Stahl. Taxon specific hybridization probes for fiber-digesting bacteria suggest novel gut-associated *Fibrobacter*. *Syst. Appl. Microbiol.* **17**: 418-424 (1994).
73. Risatti, J.B., W.C. Capman, and D.A. Stahl. Community structure of a microbial mat: The phylogenetic dimension. *Proc. Natl. Acad. Sci. USA* **91**: 10173-10177 (1994).
74. Teske, A., E. Alm, J.M. Regan, S. Toze, B.E. Rittmann, and D.A. Stahl. Evolutionary relationships among ammonia- and nitrite-oxidizing bacteria. *J. Bacteriol.* **176**: 6623-6630 (1994).
75. Odenyo, A.A., R.I. Mackie, D.A. Stahl, and B.A. White. The use of 16S ribosomal RNA targeted oligonucleotide probes to study competition between ruminal fibrolytic bacteria: Development of probes for *Ruminococcus* species and evidence for bacteriocin production. *Appl. Environ. Microbiol.* **60**: 3688-3696 (1994).
76. Odenyo, A.A., R.I. Mackie, D.A. Stahl, and B.A. White. The use of 16S ribosomal RNA targeted probes to study competition between ruminal fibrolytic bacteria: Pure culture studies with cellulose and alkaline peroxide treated wheat straw. *Appl. Environ. Microbiol.* **60**: 3697-3703 (1994).
77. Lin, C., J.W. Urbance, and D.A. Stahl. *Acetivibrio cellulolyticus* and *Bacteroides cellulosolvens* are members of the greater clostridial assemblage. *FEMS Microbiol. Lett.* **124**: 151-155 (1994).
78. Smets, B.F., B.E. Rittmann, and D.A. Stahl. Stability and conjugal transfer kinetics of a TOL plasmid in *Pseudomonas aeruginosa* PAO 1162. *FEMS Microbiol. Ecol.* **15**: 337-350 (1994).
79. Stahl, D.A., R.I. Amann, L.K. Poulsen, L. Raskin, and W.C. Capman. The use of fluorescent probes for determinative microscopy. pp. 111-121. In: *Archaea: A laboratory manual*. F.T. Robb, K.R. Sowers, S. DasSarma, A.R. Place, H.J. Schreier, and E.M. Fleischmann (Eds.) Cold Spring Harbor Laboratory Press, Cold Spring Harbor, N.Y. (1995).

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81. Lin, C. and D.A. Stahl. Taxon-specific probes for the cellulolytic genus *Fibrobacter* reveal novel and abundant equine-associated populations. *Appl. Environ. Microbiol.* **61**: 1348-1351. (1995)
82. Rittmann, B.F. Smets, J.A. MacDonald, and D.A. Stahl. Plasmid transfer for enhancing degradation capabilities. *Environment Health Perspectives* **103**, Supplement 5: 113-115 (1995).
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84. Lin, C. and D.A. Stahl. Comparative analyses reveal a highly conserved endoglucanase in the cellulolytic genus *Fibrobacter*. *J. Bacteriol.* **177**: 2543-2549 (1995).
85. Stahl, D.A. Application of phylogenetically-based probes to microbial ecology. *Molecular Ecol.* **4**: 535-542 (1995).
86. Smets, B. F., B. E. Rittmann, and D. A. Stahl. Quantification of the effect of substrate concentration on the conjugal transfer rate of the TOL plasmid in short-term batch mating experiments. *Let. Appl. Microb.* **21**:167-172 (1995).
87. Ohashi, A., D.G.V. de Silva, B. Mobarry, J. Manem, D.A. Stahl. and B.E. Rittmann. Influence of substrate C/N ratio on the structure of multi-species biofilms consisting of nitrifiers and heterotrophs. *Water Science and Technology* **32**: 75-84 (1995).
88. Alm, E. and D.A. Stahl. Extraction of DNA from sediments. *In*: Akkermans, A.K.L., J.D. van Elsas, and F.J. de Bruijn (Eds.) *Molecular Microbial Ecology Manual*. Kluwer academic publishers, Dordrecht, The Netherlands (1996).
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52. MacGregor, B.J., D.P. Moser, E.W. Alm, K.H. Nealson, and D.A. Stahl. Molecular and chemical characterization of a sediment microbial community in Lake Michigan. Annual Meeting of the North Central Branch of the American Society for Microbiology. University of Wisconsin-Milwaukee. October 11-12, 1996.
53. Stahl, D.A. , M. Wagner, G. Brusseau, and J. Flax. What can gene comparisons tell us about ancient metabolism. 35th Hanford Symposium on Health and the Environment. Richland, Washington. October 21-24, 1996.
54. Urbain, V., B. Mobarry, V. de Silva, D. Stahl, B. Rittmann, and J. Manem. Insight into the activated sludge process from integration of molecular tools, modeling, and chemical analyses. International Symposium on Environmental Biotechnology. Belgium, 1997.
55. de Silva, D.G.V., D.H. Abeyasinghe, D.A. Stahl, and B.E. Rittmann. Cold-temperature nitrification with bioaugmentation. Annual Meeting of the Central States Water Environment Association. Arlington Heights, IL. May 13-16, 1997.
56. Peyton, B.M., M.J. Truex, F.J. Brockman, and D.A. Stahl. Monitoring rRNA levels in groundwater and biomass collection devices during in situ bioremediation. Fourth International Symposium of the Battelle in Situ and on Site Bioremediation Meeting. New Orleans, LA. April 28 - May 1, 1997.

57. Teske, A., D.P. Moser, B. MacGregor, D.A. Stahl, and H.W. Jannasch. Microbial, Biogeochemical and rRNA profiles of North Atlantic deep-sea sediments. American Society for Microbiology. Miami Beach. May 4-8, 1997.
58. MacGregor, B.J., M. Tallefert, C.-P. Lienemann, J.-F. Gaillard, and D.A. Stahl. Molecular characterization of microbial populations in the water column of a stratified lake. American Society for Microbiology. Miami Beach. May 4-8, 1997.
59. Becker, J.G., G. Berardesco, B.E. Rittmann, and D.A. Stahl. Use of denaturing gradient gel electrophoresis to characterize anaerobic microbial consortia that degrade 3-chlorobenzoate. American Society for Microbiology. Miami Beach. May 4-8, 1997.
60. Mirzabekov, A.D., M.H. Bhattacharyya, and D.A. Stahl. Sequencing by hybridization with oligonucleotide microchips (SHOM) for toxicogenetic analysis. *The Toxicologist* **36**: 53 (1997)
61. MacGregor, B.J., D.A. Stahl, B. Baker, D.P. Moser, K.H. Nealson, B. Van Mooy, D. Hollander, H.W. Paerl, J. Zehr, and M.T. Mellon. Nitrogen fixation in offshore Lake Michigan: Stable isotope and microbiological evidence. American Society for Limnology and Oceanography, Santa Fe, NM. 1998.
62. Berardesco, G., Becker, J. G., B. E. Rittmann, and D. A. Stahl. 1998. Linking structure and function of anaerobic, 3-chlorobenzoate-degrading consortia. 98th Annual Meeting of the American Society for Microbiology, Atlanta, GA
63. Bavykin, S. G., V. Mikhailovich, V. Zakharyev, Y. P. Lysov, A. Chernyi, J. Jackman, E. Boulygina, J.J. Kelly, I. Taran, J. Ezzell, D. A. Stahl, and A. D. Mirzabekov. Biological microchip technology for discrimination of *Bacillus anthracis* and closely related species on the basis of genetic criteria. The 2nd International Workshop on the molecular biology of *Bacillus cereus* and *Bacillus anthracis*. 1999.
64. MacGregor, B.J., M. Maurer, B. Baker, D.P. Moser, K.H. Nealson, and D.A. Stahl. Seasonal changes in Lake Michigan sediment microbial activity: A model for "top-down" control of carbon conversion. Midwest Molecular Microbial Ecology Meeting, Urbana IL and Goldschmidt Conference, Cambridge MA 1999.
65. MacGregor, B.J., M. Maurer, B. Baker, D.P. Moser, K.H. Nealson and D.A. Stahl. Seasonal changes in offshore Lake Michigan sediment microbial activity: a model for grazer control of carbon conversion. University of Wisconsin - Milwaukee, Milwaukee WI. IAH 2000. October 1999.
66. Berardesco G., J. Kelly, L. Sappelsa, D. Stahl. DNA-Microchip based Microbial Monitoring. 29th International Conference on Environmental Systems, July 12-15, 1999
67. Baker, B.J., C.F. Wimpee, B.J. MacGregor, and D.A. Stahl. Phylogenetic and physiological characterization of manganese-oxidizing bacteria in Lake Michigan sediments. General Meeting of the American Society for Microbiology. Chicago, May 30 - June 3, 1999.
68. MacGregor, B.J., B.J. Baker, D.P. Moser, and D.A. Stahl. Delta proteobacteria in oxic and suboxic Lake Michigan sediments: Molecular evidence. General Meeting of the American Society for Microbiology. Chicago. May 30 - June 3, 1999.

69. Berardesco G. , J. G. Becker, B. E. Rittmann, and D. A. Stahl. Denaturing Gradient Gel Electrophoresis Comparison of Anaerobic Communities that Transform 2-Chlorophenol or 3-Chlorobenzoate. 99th Annual Meeting of the American Society for Microbiology. Chicago, IL May 30-June 3, 1999.
70. Kelly, J. J., L. Sappelsa, S. G. Bavykin, A. D. Mirzabekov, and D. A. Stahl. Optimization of DNA Microarrays for the Rapid Characterization of Microbial Community Population Structure. General Meeting of the American Society for Microbiology. Chicago,. May 30 - June 3, 1999.
71. Gough H., S. Webb, D. Stahl and J.-F. Gaillard. Variation of microbial biomass with metal concentration in anaerobic sediment from a contaminated, backwater lake. 14th International Symposium on Environmental Biogeochemistry (ISEB) Huntsville, Ontario, Canada. September 26-30, 1999.
72. Kelly, J.J. , L. Sappelsa, D. A. Stahl. Development of DNA microarray technology for the identification of nitrifying bacteria. General Meeting of the American Society for Microbiology. Los Angeles. May 21-25, 2000.
73. Gough, H., S. Webb, D. Stahl and J.-F. Gaillard. Changes in bacterial community structure in anaerobic mesocosms following incremental zinc additions. General Meeting of the American Society for Microbiology. Los Angeles. May 21-25, 2000.
74. Webb S., H. Gough, J.-F. Gaillard, D. Stahl. Chemical and Molecular Microbial assessment of a heavy-metal contaminated lake sediment. American Society for Limnology and Oceanography, Copenhagen. June 4 – 7, 2000.
75. Nolan, M.A., B. E. Jackson, S. M. Webb, J. Gaillard, and D. A. Stahl. Electrochemical study of metal-microbe interactions. American Chemical Society National Meeting on Chemical-Biological Interactions In Contaminant Fate. Washington, DC. August 23, 2000.
76. Jackson, B.E., S. Webb, M. Nolan, J-F. Gaillard, and D. Stahl. Characterization of anaerobic, metal resistant microbial populations in a contaminated lake. General Meeting of the American Society for Microbiology. Orlando, FL. May 20-24, 2001.
77. El Fantroussi, S., H. Urakawa, J.J. Kelly, L. Sappelsa, P.A. Noble, And D.A. Stahl. Optimization of 16S rRNA-based microchip “phylochip” for microbial community analysis. General Meeting of the American Society for Microbiology. Orlando, FL. May 20-24, 2001.
78. Kelly, J.J., L. Sappelsa, and D.A. Stahl. Optimized target-group discrimination using a DNA microarray format to identify nitrifying species. General Meeting of the American Society for Microbiology. Orlando, FL. May 20-24, 2001.
79. Fishbain, S. and D.A. Stahl. Sulfate reduction rates in relation to the diversity of sulfate reducers in extreme environments of Yellowstone National Park. General Meeting of the American Society for Microbiology. Orlando, FL. May 20-24, 2001.
80. Gough, H.L. and D.A. Stahl. Bacterial masking while direct counting in sediments: The importance of dilution rates. General Meeting of the American Society for Microbiology. Orlando, FL. May 20-24, 2001.

81. Findlay, R.H., C. Yeates, L.A. Kaplan, X. Cheng, D.A. Stahl and M. A. Hullar. Complex carbohydrate composition influences microbial community structure. Abstracts of the 102nd General Meeting of the American Society for Microbiology. Salt Lake city, Utah May 19-23, 2002.
82. Hullar, M.A., L. Kaplan², and D. A. Stahl. Links from bacteria to biomes: dissolved organic matter diversity may influence bacterial diversity. Abstracts of the 102nd General Meeting of the American Society for Microbiology. Salt Lake city, Utah May 19-23, 2002

Official Reports

Carr, M.H. D.J. McCleese, J.L. Bada, D.D. Bogard, B.C. Clark, D. DeVincenzi, M.J. Drake, K.H. Nealson, J.J. Papike, M.S. Race, and D. Stahl. Mars Sample Handling and Requirements Panel (MSHARP) Final Report. National Aeronautics and Space Administration and Jet Propulsion Laboratory Report TM-1999-209145 (1999).

Esposito, L.W., A.F. Cheng, B.C. Clark, M. Daly, E.I. Friedmann, B.M. Jakosky, R.Y. Morita, A.-L. Reysenbach, D.A. Stahl, and D.A. Smith. NRC Space Studies Board Task Group Report on the Forward Contamination of Europa.

Patent Applications

Means for qualitative and quantitative analysis of microbial populations potentially present in a sample. E. Guillot, V. Urbain, J. Manem, B.E. Rittmann, D.A. Stahl, J. Flax, M. Wagner (Co-Inventors).

Invited Seminars

University of Georgia, May 1985.

University of Maryland, Department of Microbiology, May 1986.

Illinois State, Department of Biological Sciences, December 1986.

National Animal Disease Center, December 1986.

Annual Meeting American Society for Microbiology, March 1987.

- Molecular techniques for the study of mixed methanogenic cultures.
- Evolutionary tools for microbial ecology and evaluating ecosystem perturbations.
- Phenotypic diversity versus phylogenetic depth.

University of Minnesota, Duluth, Department of Biology, April 1987

Gene-Track Systems, Framingham, Massachusetts, May 1987.

American Chemical Society Symposium on biotechnology in crop protection, Snowbird, Utah, May 1987.

University of Wisconsin, Madison. Department of Bacteriology Distinguished Speakers Colloquium, November 1987.

Molecular Biosystems Incorporated, San Diego, CA, January 1988.

Gen-Probe, San Diego, CA, March 1988.

Co-chaired Round Table on Detection Methods including Sequencing and Probes. First International Conference on the Release of Genetically Engineered Microorganisms. Cardiff, Wales UK, April 1988.

University of Tennessee, September 1988.

University of Wisconsin, School of Veterinary Medicine, February 1989.

ACS Symposium, Dallas, Texas, April 1989.

University of Maryland Center of Marine Biotechnology, May 1989.

Gray Freshwater Biological Institute Symposium on Microbial Ecology and Biodegradation, July 1989.

Loyola University, September 1990.

Oak Ridge National Laboratory, January 1991.

University of Otago, New Zealand, July 1991.

Oklahoma State University, September 1991.

Southern Illinois University, October 1991.

The Upjohn Company, January 1992.

Virginia Technical University, March 1992.

Technical University of Munich, March 1992.

Lilly Research Laboratories, November 1992.

University of Wisconsin, February 1993.

Indiana University, March 1993.

University of Calgary, March 1994. Alberta Heritage Foundation for Medical Research Visiting Lecturer

DuPont Central Research. January 1995 and April 1997

University of Minnesota, Department of Microbiology. February 1995

Oregon State University, Sugihara Award Symposium. January 1996

California Institute of Technology. February 1997.

DuPont Central Research & Development,. May 1997

Center of Marine Biotechnology, University of Maryland. June 1997.

Max Planck Institute for Marine Microbiology. Bremen, Germany September 1997

Technical University of Delft. The Netherlands. September 4, 1997

ASM Foundation for Microbiology Lecture. University of Washington. ASM Branch Meeting. September 1997.

Miami University. Orton K. Stark distinguished lecturer. April 1998.

Fermilab, Battavia, IL. Colloquium Speaker. October 1999.

Jet Propulsion Laboratory, Pasadena, CA. April 17, 2001.

Iowa State University. Miller Distinguished Lecturer. April 26, 2001.

University of Connecticut. Department of Microbiology. April 24-26, 2002.

Invited Participant

Dahlem Workshop on Structure and Function of Biofilms. Berlin, November 27-December 2, 1988.

International Conference on Microbial Ecology, Kyoto, Japan, August 27- September 11, 1989.

First International Symposium on Microbiology of the Deep Subsurface. Orlando, FL, January 15-19, 1990.

European Environmental Research Organization Workshop on Molecular Microbial Ecology, Braunschweig, Federal Republic of Germany, April 28-May 1, 1990.

Fourth International Congress of Systematic and Evolutionary Biology. University of Maryland, College Park, July 1-7, 1990.

ASM International Conference on Multicellular Behavior of Bacteria, Woods Hole, MA, October 21-25, 1990.

U.S.E.P.A. Environmental Research Laboratory Symposium on Microbial Diversity, Gulf Breeze, FL, November 15, 1991.

Annual Scientific Meeting of the Australian Society for Microbiology. Gold Coast, Queensland, Australia, June 30-July 5, 1991.

Annual Meeting of the Society for Industrial Microbiology, Philadelphia, PA, August 4-7, 1991.

Society for General Microbiology Biodiversity Symposium, University of Cardiff, Wales, March 23-26, 1992.

French Society for Microbiology, Lyon, France, April 1992.

ASM International Conference on Multicellular Behavior of Bacteria, Woods Hole, MA, March 28-April 1, 1993.

Microbial Diversity Mini Symposium Series. Biofilm Mini Symposium. Marine Biological Laboratories. Woods Hole, MA, June 26, 1993.

Society for Industrial Microbiology and Canadian Society for Microbiology Joint Annual Meeting. Toronto, Canada, July 31-August 6, 1993.

NATO Advanced Research Workshop. Structure, development, and significance of microbial mats. Arcachon, France. September 27- October 1, 1993.

European Community Meeting on Biosafety and Microbial Ecology. Granada, Spain. October 24 - 27, 1993

Invited Lecturer Division N Symposium on Molecular Techniques in Applied and Environmental Research. American Society for Microbiology General Meeting. May 1994.

U.S. Army Construction Engineering Laboratory and Northwestern University Environmental Council Symposium on Frontiers in Environmental Technology. Northwestern University. June 1994

Royal Netherlands Academy of Arts and Sciences. Colloquium. Ecology of pathogenic bacteria: Molecular and evolutionary aspects. Amsterdam, The Netherlands. January 1 - February 3, 1995.

Invited Lecturer Divisional Group III Symposium and Division N Seminar. American Society for Microbiology General Meeting. May 1995.

Society for General Microbiology. Main Symposium. Ecophysiology: Adaptation to the niche. Aberdeen, Scotland. September 10 -14, 1995

Sugahara Symposium, Oregon State University. January 10, 1996

American Academy of Microbiology Colloquium. The Microbial World: Foundation of the Biosphere. Palm Coast, Florida. January 19-21, 1996.

General Meeting of the American Society for Microbiology. Symposium. Application of Molecular Techniques for Addressing Environmental Problems. New Orleans, Louisiana, May 19-23, 1996.

First Meeting on Complex Adaptive Systems Ecology. Copenhagen, Denmark. June 15-18, 1996.

Gordon Conference. Environmental Sciences: Water. New Hampton School, New Hampshire. June 23-28, 1996

1996 Congresses of the International Union of Microbiological Societies. Jerusalem, Israel. August 18-23, 1996.

American Society for Microbiology. North Central Branch Meeting. University of Wisconsin-Milwaukee. October 11-12, 1996

1996 Hanford Symposium. Microbial Genome Research and its Applications. Richland, Washington. October 21-24, 1996

Institut National de la Recherche Agronomique. Structure and Dynamics of Microbial Ecosystems: RNA-targeted Molecular Approaches. Jouy-en-Josas, France. January 23-24, 1997.

CBD Porton Down. Characterization of Ambient Bioaerosols Workshop. Salisbury, England. February 25-27, 1997.

Complex Adaptive Systems Ecology Workshop. Chinchon, Spain. May 31 - June 3, 1997.

Gordon Conference. Applied and Environmental Microbiology. Newport, R.I. August 17-21, 1997.

COE Symposium on Microbial Community Structure and Function in Wastewater Treatment Processes. Tokyo, Japan. March 10-11, 1998.

IAWQ Specialty Conference on Microbial Ecology of Biofilms. Lake Bluff, Illinois. October 8-10, 1998.

Korber Symposium on Molecular and Microsensor Studies of Microbial Communities. Bremen, Germany. September 7-11, 1998.

Gordon Research Conference on Microbial Population Biology. Plymouth, New Hampshire. July 18-23, 1999.

ASM Conference on Microbial Biodiversity. Chicago, Illinois. August 5-9, 1999.

NASA Thermal Biology Workshop. Bozeman, Montana. March 6-7, 2000.

ASLO Sensor Workshop. ASLO 2000 Summer Meeting. Copenhagen. June 5-9, 2000.

American Academy of Microbiology colloquium on Geobiology: Exploring the Interface Between the Geosphere and the Biosphere. Tucson, Arizona. December 1-3, 2000.

Congressional Briefing to promote genomic science and technology in environmental engineering. Washington, DC. March 1, 2001.

Gordon Research Conference on Applied and Environmental Microbiology. July 22-27, 2001.

Ninth International Symposium on Microbial Ecology. Amsterdam. August 26-31, 2001.

AAAS Annual Meeting. Session on "New Biology of Rocks". Boston, MA. February 14-19, 2002.

Marine Biological Laboratory NASA Workshop on Outcomes of Genome-Genome Interactions. Woods Hole MA, May 1-2, 2002.

Opening Lecturer for 7th Symposium on Bacterial Genetics and Ecology (BAGECO-7), Bergen Norway. June 16 – 19, 2002.