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Education

Ph.D., Molecular Microbiology, 1997

The Ohio State University, Columbus, OH

Thesis Title: "Regulation of Gene Transcription in the Archaeon *Haloferax volcanii* using the Heat Shock Response as a Model System"

Advisor: Charles J. Daniels, Ph.D.

M.A., English (Technical Writing/Scientific Discourse), 1992

Pennsylvania State University, University Park, PA

M.S., Anaerobic Microbiology, 1989

Virginia Polytechnic Institute and State University, Blacksburg, VA

Thesis Title: "Acetoacetyl Coenzyme A-Reacting Enzymes in Solvent-Producing *Clostridium beijerinckii* B593"

Advisor: Jiann-Shin Chen, Ph.D.

B.A., Microbiology and English (Literature), Summa Cum Laude, 1986

University of Tennessee, Knoxville, TN

Professional Experience

- 2001-present **Research Assistant Professor** (Joint Staff Position – Michigan State University Center for Microbial Ecology and Environmental Sciences Division at Oak Ridge National Laboratory).
- 1999-2001 **Research Associate, Environmental Sciences Division, Oak Ridge National Laboratory (Oak Ridge, Tennessee).** Research projects: Generation of *Shewanella oneidensis* MR-1 regulatory mutants and expression analysis using DNA microarrays; development and application of genomic DNA microarray-based methods for analyzing the composition and structure of microbial communities in natural environments. Other activities: Research proposal writing; manuscript writing; recruiting.
- 1998-1999 **Oak Ridge Institute for Science and Education (ORISE) Fellow, Division of Bacterial Parasitic and Allergenic Products, Center for Biologics Evaluation and Research, Food and Drug Administration (Bethesda, Maryland).** Research projects: Developed and applied a typing system for *Neisseria gonorrhoeae* based on biotinylated oligonucleotide probes to porin gene variable regions; investigated the immune response in mice to potential peptide-liposome vaccines for gonorrhea using ELISA, Western blot analysis, whole-cell dot blots, and bactericidal assays. Other activities: Manuscript writing; supervised a Howard Hughes Medical Institute/NIH Teacher Intern (summer, 1999); DNA Microarray Workshop at NIH, Bethesda, MD, 1998; Foundation for the Advancement of Education in the Sciences Graduate School at the National Institutes of Health (Course: A Genetic Approach to Emerging Complex Diseases, 1999).

- 1992-1997 **Graduate Research Associate, Department of Microbiology, The Ohio State University (Columbus, Ohio).** Research projects: Defined the nucleotide sequence requirements for basal/activated expression of an archaeal heat shock gene using an *in vivo* transcriptional reporter assay, deletion mutagenesis, DNA sequencing, comparative sequence analysis, and PCR-directed site mutagenesis; characterized the transcription of a differentially expressed eukaryotic-like TFIIB homolog using Northern blot hybridization, primer extension, *in vivo* promoter analysis with a tRNA reporter gene, and an *in vivo* termination assay; constructed a polyhistidine-tagged archaeal TFIIB, overexpressed His-tagged TFIIB in *E. coli*, and purified the recombinant protein by affinity chromatography; analyzed native and recombinant proteins using polyclonal antibodies generated against recombinant archaeal TFIIB. Teaching activities: Prepared and supervised a laboratory module for graduate students and postdocs as part of the Ohio State Microbial Physiology Institute, a summer course sponsored by NSF, DOE, and the OSU College of Biological Sciences (1995); taught undergraduate courses Microbiology 521 Laboratory and Microbial Genetics 581.
- 1990-1992 **Graduate Teaching Assistant and Lecturer, Department of English, The Pennsylvania State University (University Park, Pennsylvania).** Taught freshman composition & rhetoric and technical writing.
- 1990 **Teaching Assistant, Howard Hughes Scholars Institute in Genetics, Department of Biology, The Pennsylvania State University (University Park, Pennsylvania).**
- 1986-1989 **Graduate Research Assistant, Department of Anaerobic Microbiology, Virginia Tech (Blacksburg, Virginia).** Research projects: Purified a clostridial acetoacetyl CoA-reacting phosphotransbutyrylase (PTB) using hydroxylapatite chromatography, gel filtration, and dye-ligand affinity chromatography; analyzed the kinetic properties of PTB using standard spectrophotometric methods. Leadership activities: *Vice-Speaker*, Virginia Tech Graduate Student Assembly (1987-88); *Editor*, Virginia Tech Graduate Student Newsletter (1987-88).

Funded Proposals

- “Development and Use of 16S rRNA Gene-Based Oligonucleotide Microarrays for Assessing Microbial Community Composition and Dynamics” (funded by the DOE NABIR Program, 2000). Co-PI with J. Zhou, R. A. Hurt, Y. Xu, and D. Xu
- “Linking Genomics to Cellular Responses and Mechanisms for Radiation Resistance in *Deinococcus radiodurans*” (funded by ORNL Laboratory Directed Research and Development Program, 2000). Co-PI with J. Zhou, R. Hettich, R. Hobbs, R. Burlage, G. Li, and A. Beliaev
- “Use of DNA Microarrays for Understanding the Genetic and Metabolic Regulation of Carbon Dioxide Fixation and Hydrogen Production in *Rhodospseudomonas palustris*” (funded by the DOE Microbial Genome Program, 2001). Co-PI with C. Harwood and J. Zhou

Professional Memberships

American Society for Microbiology

Awards, Scholarships, and Other Honors

ORISE Fellowship Recipient, 1998-99

J. Robie Vestal Award (1st Prize), Ohio Branch of the American Society for Microbiology, 1997

Marquis Who's Who of American Women, 1997 biographical entry

Braucher Award for academic merit (\$3,000), 1989-90
Omicron Delta Kappa Leadership Honor Society, inducted 1988
Dean's Fellowship, 1986-88
Phi Beta Kappa Honor Society, inducted 1985
Margaret Elizabeth Hodges Scholarship, 1984-85
Phi Kappa Phi Honor Society, inducted 1984
Frederick T. Bonham Scholarship, 1983-84
Woman of Achievement Award for Outstanding Accomplishment in Scholarship, 1983

Publications

1. **Thompson, D. K.**, A. S. Beliaev, C. S. Giometti, S. L. Tollaksen, T. Khare, D. P. Lies, K. H. Nealson, H. Lim, J. Yates III, C. C. Brandt, J. M. Tiedje, and J.-Z. Zhou. 2002. Transcriptional and proteomic analysis of a ferric uptake regulator (Fur) mutant of *Shewanella oneidensis*: Possible involvement of Fur in Energy Metabolism, Transcriptional Regulation and Oxidative Stress. *Applied and Environmental Microbiology* (in press).
2. Beliaev, A. S., **D. K. Thompson**, T. Khare, H. Lim, C. C. Brandt, G. Li, A. E. Murray, J. F. Heidelberg, C. S. Giometti, J. Yates III, K. H. Nealson, J. M. Tiedje, and J. Zhou. 2002. Gene and protein expression profiles of *Shewanella oneidensis* during anaerobic growth with different electron acceptors. *OMICS: A Journal of Integrative Biology* 6:39-60.
3. Zhou, J.-Z. and **D. K. Thompson**. 2002. Microarrays: applications in environmental microbiology. Britton, G. (Editor-in-Chief), *The Encyclopedia of Environmental Microbiology*, John Wiley & Sons, New York. Invited paper.
4. Wu, L., **D. K. Thompson**, G. Li, R. A. Hurt, J. M. Tiedje, and J. Zhou. 2001. Development and evaluation of functional gene arrays for detection of selected genes in the environment. *Applied and Environmental Microbiology* 67:5780-5790.
5. **Thompson, D. K.**, C. D. Deal, C. Ison, J. Zenilman, and M. C. Bash. 2000. A typing system for *Neisseria gonorrhoeae* based on biotinylated oligonucleotide probes to PIB gene variable regions. *Journal of Infectious Diseases* 181:1652-1660.
6. **Thompson, D. K.**, J. R. Palmer, and C. J. Daniels. 1999. Expression and heat-responsive regulation of a TFIIB homologue from the archaeon *Haloferax volcanii*. *Molecular Microbiology* 33:1081-1092.
7. **Thompson, D. K.**, and C. J. Daniels. 1998. Heat shock inducibility of an archaeal TATA-like promoter is controlled by adjacent sequence elements. *Molecular Microbiology* 27:541-551.
8. Kuo, Y.-P.,* **D. K. Thompson**,* A. St. Jean, R. L. Charlebois, and C. J. Daniels. 1997. Characterization of two heat shock genes from *Haloferax volcanii*: A model system for transcription regulation in the Archaea. *Journal of Bacteriology* 179:6318-6324. *Authors contributed equally to this work.
9. **Thompson, D. K.** 1993. Arguing for experimental facts in science: A study of research article results sections in biochemistry. *Written Communication* 10:106-128.
10. Contributor for 1993 Bibliography: Relations of Literature and Science, 1989-1990. In *Configurations* 2:283-319.
11. **Thompson, D. K.**, and J.-S. Chen. 1990. Purification and properties of an acetoacetyl coenzyme A-reacting phosphotransbutyrylase from *Clostridium beijerinckii* ("Clostridium butylicum") NRRL B593. *Applied and Environmental Microbiology* 56:607-613.

Manuscripts in Preparation

Thompson, D. K., F. V. Lynn, M. M. McGowen, and M. C. Bash. Immunogenicity of liposomes containing synthetic cyclic peptides to surface-exposed loops of the *Neisseria gonorrhoeae* PorB protein.

Selected Abstracts and Conference Presentations (out of 18 total)

Wu, L., **D. K. Thompson**, J. M. Tiedje, and J. Zhou. 2001. Community genome arrays for analysis of microbial populations in natural environments. Abstract N-63, American Society for Microbiology General Meeting, Orlando, FL.

Thompson, D. K., A. Beliaev, G. Li, C. S. Giometti, S. Tollaksen, D. Lies, K. H. Nealson, and J. Zhou. 2000. Generation and analysis of a *fur* (ferric uptake regulator) mutant of *Shewanella oneidensis* MR-1 using genomic and proteomic approaches. 8th Annual International Meeting on Small Genomes, Lake Arrowhead, CA.

Thompson, D. K., C. Deal, K. Schmidt, J. Zenilman, C. E. Frasch, and M. C. Bash. 1999. A genotyping system for *Neisseria gonorrhoeae* based on biotinylated oligonucleotide probes to PIB gene variable regions. Abstract C-370, American Society for Microbiology General Meeting, Chicago, IL.

Thompson, D. K., and C. J. Daniels. 1996. Functional analysis of transcriptional regulatory signals of an archaeal heat shock gene: Identification of a TATA-proximal response element. Abstract E3-348, Transcriptional Mechanisms Keystone Symposium, Taos, NM.

Thompson, D. K., J. R. Palmer, and C. J. Daniels. 1995. Transcriptional regulation of a HSP60 gene and characterization of the TATA-binding protein from the archaeon *Haloferax volcanii*. Abstract I-64, American Society for Microbiology General Meeting, Washington, DC.

Invited Talks

“The development of an oligonucleotide-based genotyping system for *Neisseria gonorrhoeae*.” STD Interest Group, Johns Hopkins University, 19 May 1999, Baltimore, MD.

“Oligonucleotide probes to PI variable regions.” Gonococcal Typing Workshop at the 13th Meeting of the International Society for Sexually Transmitted Diseases Research, 15 July 1999, Denver, CO.

“Using Microarray Technology to Analyze Microbial Community Structure and Function in Natural Environments.” The 9th International Conference on Microbial Genomes, October 28-November 1, 2001, Gatlinburg, TN.

REFERENCES

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