

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed for Form Page 2.
Follow the sample format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME		POSITION TITLE	
Everett Peter Greenberg		Professor of Microbiology Shepperd Professor of Molecular Pathogenesis	
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Western Washington Univ, Bellingham, WA	BA	1970	Biology
University of Iowa,	MS	1972	Microbiology
University of Massachusetts, Amherst, MA	PhD	1977	Microbiology
Harvard University, Cambridge, MA	Postdoctoral	1978	Biological Sciences

RESEARCH AND PROFESSIONAL EXPERIENCE:

1974-1977 NIH Predoctoral Trainee, University of Massachusetts
1977-1978 NIH Postdoctoral Fellow & Harvard Postdoc. Fellow, Harvard University
1978-1984 Assistant Professor, Cornell University
1980-1984 Instructor, Microbiology Summer Program, Marine Biological Laboratory
1982-1988 Editorial Board, Annual Reviews of Microbiology
1982-1992 Editorial Board, Journal of Bacteriology
1984-1988 Associate Professor (with tenure), Cornell University
1985-1989 Co-Director, Microbiology Summer Program, Marine Biological Laboratory
1986-1988 Graduate Program Director, Microbiology, Cornell University
1987 Elected Member, American Academy of Microbiology, Elected Member, New York Academy of Sciences, Elected Member, Marine Biological Labs, ASM Foundation Lecturer
1987-1990 ASM Minority Student Career Support Program, lecturer
1988-1990 Associate Professor (with tenure), University of Iowa
1988-2000 Associate Editor, Annual Reviews of Microbiology
1989 Elected Fellow, American Association for the Advancement of Science
1990 Professor, University of Iowa
1991-2001 Editor, Journal of Bacteriology
1991- Associate Director, University of Iowa Cystic Fibrosis Research Center
1997-2000 Director, NSF Gene Regulation in Bioremediation-Research Training Program
1997- Editorial Board, Current Opinions in Microbiology
2000 Appointed Shepperd Professor of Molecular Pathogenesis
2001- Chiron Award Selection Committee
2001- Amer. Acad. Microbiol. Nominating Committee
2002- Director, W. M. Keck Foundation Microbial Communities and Cell Signaling Program
2002 Elected Fellow, American Academy of Arts and Sciences
2003 Elected American Academy of Microbiology Board of Governors
2004 Elected Fellow National Academy of Sciences

PUBLICATIONS (1999-2004):

1. Costerton, J. W., P. S. Stewart, and E. P. Greenberg. 1999. Bacterial biofilms: a common cause of persistent infections. *Science* **286**:1318-1322.
2. Greenberg, E. P. 1999. Quorum sensing in gram-negative bacteria: acylhomoserine lactone signalling and cell-cell communication. p. 71-84. *In* R. England, G. Hobbs, N. Bainton, D. McL. Roberts (Eds.), *Microbial signalling and communication*. Cambridge University Press.

3. Hastings, J. W., and E. P. Greenberg. 1999. Quorum sensing: the explanation of a curious phenomenon reveals a common characteristic of bacteria. *J. Bacteriol.* 181:2667-2668.
4. Stevens, A. M., N. Fujita, A. Ishihama, and E. P. Greenberg. 1999. Involvement of the RNA polymerase alpha-subunit C-terminal domain in LuxR-dependent activation of the *Vibrio fischeri* luminescence genes. *J. Bacteriol.* 181:4704-4707.
5. Hanzelka, B., M. R. Parsek., D. L. Val, P. V. Dunlap, J. E. Cronan, Jr., and E. P. Greenberg. 1999. Acylhomoserine lactone synthase activity of the *Vibrio fischeri* AinS protein. *J. Bacteriol.* 181:5766-5770.
6. Pesci, E. C., J. B. Pearson, S. McKnight, A. S. Kende, E. P. Greenberg, and B. H. Iglewski. 1999. Quinolone signaling in the cell-to-cell communication system of *Pseudomonas aeruginosa*. *Proc. Natl. Acad. Sci. USA* 96:11229-11234.
7. Whiteley, M., K. M. Lee, and E. P. Greenberg. 1999. Identification of genes controlled by quorum sensing in *Pseudomonas aeruginosa*. *Proc. Natl. Acad. Sci. USA* 96:13904-13909.
8. Parsek, M. R., and E. P. Greenberg. 1999. Quorum sensing signals in development of *Pseudomonas aeruginosa* biofilms. *Methods Enzymol.* 310:43-55.
9. Eglund, K. A., and E. P. Greenberg. 2000. Conversion of the *Vibrio fischeri* transcriptional activator, LuxR, to a repressor. *J. Bacteriol.* 182:805-811.
10. Travis, S. M., N. N. Anderson, W. R. Forsyth, C. Espiritu, B. D. Conway, E. P. Greenberg, P. B. McCray, Jr., R. I. Lehrer, M. J. Welsh, and B. Tack. 2000. Bactericidal activity of mammalian cathelicidin-derived peptides. *Infect Immun.* 68:2748-2755.
11. Whiteley, M., M. R. Parsek, and E. P. Greenberg. 2000. Regulation of quorum sensing by RpoS in *Pseudomonas aeruginosa*. *J. Bacteriol.* 182:4356-4360.
12. Parsek, M. R. and E. P. Greenberg. 2000. Acyl-homoserine lactone quorum sensing in Gram-negative bacteria: a signaling mechanism involved in associations with higher organisms. *Proc. Natl. Acad. Sci. USA* 97:8789-8793.
13. Schaefer A. L., B. L. Hanzelka, M. R. Parsek, and E. P. Greenberg. 2000. Detection, purification, and structural elucidation of the acylhomoserine lactone inducer of *Vibrio fischeri* luminescence and other related molecules. *Methods Enzymol.* 305:288-301.
14. Greenberg, E. P. 2000. Bacterial genomics: pump up the versatility. *Nature* 406:947-948.
15. Singh, P. K., A. L. Schaefer, M.R. Parsek, T. O. Moninger, M. J. Welsh and E. P. Greenberg. 2000. Quorum sensing signals indicate that cystic fibrosis lungs are infected with bacterial biofilms. *Nature* 407:762-764.
16. Leadbetter, J. R. and E. P. Greenberg. 2000. Metabolism of acyl-homoserine lactone quorum-sensing signals by *Variovorax paradoxus*. *J. Bacteriol.* 182:6921-6926.
17. Eglund, K. A. and E. P. Greenberg. 2001. Quorum sensing in *Vibrio fischeri*: analysis of the LuxR DNA binding region by alanine-scanning mutagenesis. *J. Bacteriol.* 183:382-386.
18. Chugani, S. A., M. Whiteley, K. M. Lee, D. D'Argenio, C. Manoil. and E. P. Greenberg. 2001. QscR, a modulator of quorum-sensing signal synthesis and virulence in *Pseudomonas aeruginosa*. *Proc. Natl. Acad. Sci. USA* 98:2752-2757.
19. Fuqua C, M. R. Parsek and E. P. Greenberg. 2001. Regulation of gene expression by cell-to-cell communication: acyl-homoserine lactone quorum sensing. *Annu Rev. Genet.* 35:439-68.
20. Whiteley M., M. G. Banger, R. E. Bumgarner, M. R. Parsek, G. M. Teitzel, S. Lory and E. P. Greenberg. 2001. Gene expression in *Pseudomonas aeruginosa* biofilms. *Nature* 413:860-864.
21. Whiteley M. and E. P. Greenberg. 2001. Promoter specificity elements in *Pseudomonas aeruginosa* quorum-sensing-controlled genes. *J. Bacteriol.* 183:5529-5534.
22. Schaefer A.L., E. P. Greenberg and M. R. Parsek. 2001. Acylated homoserine lactone detection in *Pseudomonas aeruginosa* biofilms by radiolabel assay. *Methods Enzymol.* 336:41-47.
23. Park, J., I. Hwang, J. Kim, S. O. Lee, B. Conway, E. P. Greenberg and K. Lee. 2001. Characterization of quorum-sensing signal molecules produced by *Burkholderia cepacia* G4. 2001 *J. Microbiol. Biotechnol.* 11: 804-811.
24. Conway, B. and E.P. Greenberg. 2002. Quorum-sensing signals and quorum-sensing genes in *Burkholderia vietnamiensis*. *J. Bacteriol.* 184:1189-119.
25. Singh, P., M.R. Parsek, E. P. Greenberg and M.J. Welsh. 2002. A component of innate immunity prevents biofilm development. *Nature* 417:552-555.
26. Fuqua C and E. P. Greenberg. 2002. Listening in on bacteria: acyl-homoserine lactone signalling. *Nat*

Rev Mol Cell Biol. 3:685-95.

27. Schaefer A. L., T. A. Taylor J. T. Beatty and E. P. Greenberg. 2002. Long-Chain Acyl-Homoserine Lactone Quorum-sensing regulation of *Rhodobacter capsulatus* gene transfer agent production. J Bacteriol. 184:6515-6521.
28. Schuster, M., C. P. Lostroh, T. Ogi and E. P. Greenberg. 2003. Identification, timing and signal specificity of *Pseudomonas aeruginosa* quorum-controlled genes: a transcriptome analysis. J. Bacteriol. 185:2066-2079.
29. Greenberg E. P. 2003. Bacterial communication: tiny teamwork. Nature. 424:134.
30. Lupp C., M. Urbanowski , E. P. Greenberg and E. G., Ruby. 2003. The *Vibrio fischeri* quorum-sensing systems *ain* and *lux* sequentially induce luminescence gene expression and are important for persistence in the squid host. Mol. Microbiol. 50:319-331.
31. Greenberg E. P. 2003. Bacterial communication and group behavior. J. Clin. Invest. 112:1288-1290.
32. Urbanowski M. L., C. P. Lostroh and E. P. Greenberg. 2004. Reversible Acyl-Homoserine Lactone Binding to Purified *Vibrio fischeri* LuxR Protein. J. Bacteriol. 186:631-637.
33. J. M. Yarwood, D. J. Bartels, E. M. Volper and E. P. Greenberg. 2004. Quorum sensing in *Staphylococcus aureus* biofilms. J Bacteriol. 186:1838-1850.
34. Chun, C. K., E. A. Ozer, M. J. Welsh, J. Zabner and E. P. Greenberg. 2004. Inactivation of a *Pseudomonas aeruginosa* quorum-sensing signal by human airway epithelia. Proc Natl Acad Sci USA. 101:3587-3590.
35. Schuster, M., A. C. Hawkins, C. S. Harwood, E. P. Greenberg. 2004. The *Pseudomonas aeruginosa* RpoS regulon and its relationship to quorum sensing. Mol. Microbiol. 51:973-985.
36. Bagge N, M. Schuster, M. Hentzer, O. Ciofu, M. Givskov, E. P. Greenberg and N. Hoiby. 2004. *Pseudomonas aeruginosa* biofilms exposed to imipenem exhibit changes in global gene expression and beta-lactamase and alginate production. Antimicrob. Agents Chemother. 48:1175-1187.
37. Matsukawa, M., and E. P. Greenberg EP. 2004. Putative Exopolysaccharide Synthesis Genes Influence *Pseudomonas aeruginosa* Biofilm Development. J Bacteriol. 186:4449-4456.
38. Schuster, M., M. L. Urbanowski and E. P. Greenberg. 2004. Promoter specificity in *Pseudomonas aeruginosa* quorum sensing revealed by DNA binding of purified LasR. Proc Natl Acad Sci U S A. 101: 15833-15839.
39. Yahr, T. L. and E.P. Greenberg. 2004. The Genetic Basis for the Commitment to Chronic versus Acute Infection in *Pseudomonas aeruginosa*. Molecular Cell. 16:497-498.

RESEARCH SUPPORT

National Institutes of Health, AID-N01-AI-30040

Pseudomonas and respiratory epithelia.

11/01/03-10/31/10, Annual Direct Costs, \$305,000

The goal of this project is to use microarray technology to identify targets for *Pseudomonas* vaccine or drug development for treatment of respiratory infections.

30% Effort, Project Leader, M. Apicella PI

National Institutes of Health, GM59026-5

Quorum Sensing in *Pseudomonas aeruginosa*

5/1/03-4/30/03, Annual Direct Costs, \$205,000

30% Effort, E. P. Greenberg, PI

The goals of this project are to identify quorum sensing-controlled genes and to determine specificity determinants for these genes.

W. M. Keck Foundation

30% Effort, E. P. Greenberg PI

1/10/02-1/09/05, Total costs, \$2,000,000

This is a multi-investigator project aimed at discovering parallels in the mechanism of colonization by persistent bacterial pathogens and mutualistic symbiotic bacteria in host animals.