

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	
Samuel I. Miller, M.D.		Professor	
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
Johns Hopkins University, Baltimore, M.D.	B.A.	1975	History
Baylor College of Medicine, Houston, TX	M.D.	1980	Medicine

A. Positions and Honors. List in chronological order previous positions, concluding with your present position. List any honors. Include present membership on any Federal Government public advisory committee.

Postdoctoral training

1980-83 Intern, Jr Asst Resident, Sr Asst Resident, Internal Medicine, Massachusetts General Hospital, Boston
1983-84 Clinical Fellow in Medicine, Infectious Disease Unit, Massachusetts General Hospital, Boston
1984-87 Research Fellow, Tropical Public Health, Harvard School of Public Health, Boston

Academic and Hospital Appointments

1980-83 Clinical Fellow in Medicine, Harvard Medical School, Boston, MA
1983-87 Clinical and Research Fellow in Medicine, Massachusetts General Hospital, Boston, MA
1984-87 Research Fellow in Tropical Public Health, Harvard School of Public Health, Boston, MA
1986-89 Instructor in Medicine, Harvard Medical School, Massachusetts General Hospital, Boston, MA
1987-89 Clinical Assistant in Medicine, Massachusetts General Hospital, Boston, MA
1989-93 Assistant Professor of Medicine, Harvard Medical School, Boston, MA
1990-93 Assistant in Medicine, Massachusetts General Hospital, Boston, MA
1993-95 Assistant Physician, Massachusetts General Hospital, Boston, MA
1993-95 Associate Professor of Medicine, Harvard Medical School, Boston, MA
1995- Attending Physician, University of Washington Medical Center, Seattle, WA
1995-98 Associate Professor of Medicine and Microbiology, University of Washington, Seattle, WA
1998-03 Professor of Medicine and Microbiology, University of Washington, Seattle, WA
2003- Professor of Genome Sciences, Medicine and Microbiology, University of Washington, Seattle, WA

Awards

1983 Cabot Foundation Fellow
1984 Marine Biology Laboratories Tuition Award
1984-87 National Research Service Award
1987-89 Rockefeller Foundation Award
1987-89 Medical Foundation Fellow (Laboratory of John Mekalanos)
1989-94 Physician Scientist Award
1994 American Society for Clinical Investigation
1997 Squibb Award, Infectious Diseases Society of America

B. Selected peer-reviewed publications (selected from approximately 125).

- Guo L, Lim KB, Poduje CM, Daniel M, Gunn JS, Hackett M, Miller SI. Lipid A acylation and bacterial resistance against vertebrate antimicrobial peptides. *Cell*. 1998; 95:189-198.
- Rakeman JL, Bonifield HR, Miller SI. A Hila-independent pathway to *Salmonella typhimurium* invasion gene transcription. 1999 *J. Bacteriology* 1999 May; 181(10):3096-3104

3. Ernst RK, Yi EC, Guo L, Lim KB, Burns JL, Hackett M, Miller SI. Specific lipopolysaccharide found in cystic fibrosis airway *Pseudomonas aeruginosa*. *Science* 1999 Nov 19;286(5444):1561-1565.
4. Miao EA, Scherer CA, Tsolis RM, Kingsley RA, Adams LG, Baumler AJ, Miller SI. *Salmonella typhimurium* leucine-rich repeat proteins are translocated by the SPI1 and SPI2 type III secretion systems. 1999 *Molecular Microbiology* 34:850-64.
5. Yethon JA, Gunn JS, Ernst RK, Miller SI, Laroche L, Malo D, Whitfield C. *Salmonella enterica* serovar Typhimurium *waaP* mutants show increased susceptibility to polymyxin and loss of virulence *in vivo*. 2000 *Infection and Immunity*. 68:4485-91.
6. Guina T, Yi EC, Hackett M, Miller SI. A PhoP-regulated *Salmonella typhimurium* outer membrane protease promotes resistance to antimicrobial peptides. 2000 *J. Bacteriol.* 182: 4077-4086.
7. Miao E, Miller SI. A conserved amino acid sequence directing intracellular type III secretion by *Salmonella typhimurium*. 2000 *Proc. Natl. Acad. Sci. USA* 2000; 97:7539-7544.
8. Scherer CA, Cooper E, Miller SI. The *Salmonella* type III secretion translocon protein SspC is inserted into the epithelial plasma membrane upon infection. 2000 *Molecular Microbiology*, 37:1133-1145..
9. Bishop R, Gibbons HS, Miller SI, Raetz CRH. Transfer of palmitate from phospholipids to lipid A in outer membranes of Gram-negative bacteria. 2000 *EMBO J.* 19: 5071-5080.
10. Kimbrough TG, Miller SI. Contribution of *Salmonella typhimurium* type III secretion components to needle complex formation. 2000 *Proc. Natl. Acad. Sci.* 97: 11008-11013.
11. Bronstein P, Miao EA, Miller SI. InvB is a type III secretion chaperone specific for SspA. 2000 *J. Bacteriology*. Dec;182(23):6638-44.
12. Gunn JS, Ryan SS, VanVelkinburgh JC, Ernst RK, Miller SI. Genetic and functional analysis of a PmrA-PmrB regulated locus necessary for LPS modification, antimicrobial peptide resistance, and oral virulence of *Salmonella typhimurium*. 2000 *Infect Immun* Nov;68(11):6139-46.
13. Trent S, Pabich W, Raetz CRH, Miller SI. A PhoP/PhoQ Induced Lipase (PagL) that Catalyzes 3-O-Deacylation of Lipid A Precursors in Membranes of *Salmonella typhimurium*. 2001 *J Biol Chem*. Mar 23; 276(12):9083-92.
14. Lesser C, Miller SI. Modeling mammalian infection by expression of microbial virulence proteins in *Saccharomyces cerevisiae*. 2001, *EMBO J.* Apr 15;20(8):1840-9.
15. Miao EA, Freeman JA, Miller SI. Transcription of the SsrAB Regulon Is Repressed by Alkaline pH and Is Independent of PhoPQ and Magnesium Concentration. *J Bacteriol.* 2002 Mar;184(5):1493-7.
16. Hajjar AM, Ernst RK, Tsai JH, Wilson CB, and Miller SI. Human toll-like receptor 4 recognizes host-specific LPS modifications. *Nat Immunol* 2002 Apr;3(4):354-9.
17. Freeman J, Rappl C, Hensel M, Miller SI. SpiC is required for surface localization of the salmonella pathogenicity island 2 translocon proteins. *J Bacteriol.* 2002 Sep;184(18):4971-80.
18. Freeman JA, Ohl M, Miller SI. Vacuolar localization and trafficking in SseJ and SPI-2 translocated effectors that promote intracellular replication. *Infect Immun* 2003 Jan;71(1):418-27
19. Guina T, Purvine SO, Yi EC, Eng J, Goodlett DR, Aebersold R, Miller SI. Quantitative proteomic analysis indicates increased synthesis of a quinolone by *P. aeruginosa* isolates from cystic fibrosis airways. *Proc Natl Acad Sci U S A* 2003 Mar 4;100(5):2771-6.
20. Miao EA, Haraga A, Jeng RL, Welch MD, and Miller SI. *Salmonella* effectors translocated across the vacuolar membrane interact with the actin cytoskeleton. *Mol Microbiol.* 2003 Apr;48(2):401-15.
21. Haraga A, Miller SI. A *Salmonella enterica* serovar Typhimurium translocated leucine-rich repeat effector protein inhibits NF- κ B-dependent gene expression. *Infect Immun.* 2003 Jul;71(7):4052-8.
22. Bader MW, Guina T, Miller SI. Bacterial vesicle formation as a mechanism of protein transfer to animals. *Cell.* 2003 115, 1-20.
23. Bader MW, Navarre WW, Shiao W, Nikaido H, Frye JG, McClelland M, Fang FC, Miller SI. Regulation of *Salmonella typhimurium* virulence gene expression by cationic antimicrobial peptides. *Mol Microbiol.* 2003 Oct;50(1):219-30.
24. Miao EA, Brittnacher M, Haraga A, Jeng RL, Welch MD, Miller SI. *Salmonella* effectors translocated across the vacuolar membrane interact with the actin cytoskeleton. *Mol Microbiol.* 2003 Apr;48(2):401-15.
25. Ernst RK, Hajjar AM, Tsai JH, Moskowitz SM, Wilson CB, Miller SI. *Pseudomonas aeruginosa* lipid A diversity and its recognition by Toll-like receptor 4. *J Endotoxin Res.* 2003;9(6):395-400.
26. Kawasaki K, Ernst RK, Miller SI. 3-O-deacylation of lipid A by PagL, a PhoP/PhoQ-regulated deacylase of *Salmonella typhimurium*, modulates signaling through Toll-like receptor 4. *J Biol Chem.* 2004 May 7;279(19):20044-8. Epub 2004 Mar 10.
27. Rebeil R, Ernst RK, Gowen BB, Miller SI, Hinnebusch BJ. Variation in lipid A structure in the pathogenic yersiniae. *Mol Microbiol.* 2004 Jun;52(5):1363-73.
28. D'Argenio DA, Miller SI. Cyclic di-GMP as a bacterial second messenger. *Microbiology.* 2004 Aug;150(Pt 8):2497-502. Review.
29. Miller SI, Ernst RK, Bader MW. LPS, TLR4 and infectious disease diversity. *Nat Rev Microbiol.* 2005 Jan;3(1):36-46.
30. Lesser C, Miller SI. Salmonellosis. In *Harrison's Principles of Internal Medicine, 16th Edition*. McGraw-Hill. 2005. Pg 897-901.

31. Pegues DA, Ohi M, Miller SI. Salmonella including *S. typhi* In: Mandell GL, Dolan R, Bennett J.E. *Principles and Practice of Infectious Diseases, sixth edition*. Churchill Livingstone New York, NY. 2005, 2636-2654.

C. Research Support.

Ongoing Research Support

Role of the PhoP Regulon in Salmonella Virulence

Principal Investigator: Samuel I. Miller, M.D.

Agency: NIH

Type: RO1 AI30479, Period: 6/1/96-5/31/06

The major goal of this project is the characterization of genes regulated by PhoP/PhoQ. This grant is focused on genes involved on PhoP-activated genes encoding proteins important to LPS modification and antimicrobial peptide resistance, as well as PhoP-repressed genes encoding structural components of the SPI-1 secretion apparatus, such as *prgH-K*.

Salmonella Pathogenicity Island 2 Effector Proteins

Principal Investigator: Samuel I. Miller, M.D.

Agency: NIH

Type: R01 AI48683-01, Period: 01/15/2001-12/31/2005

The major goal of this project is the definition of the function of proteins translocated across the salmonella phagosome membrane by the salmonella pathogenicity Island II Type III secretion system.

Pseudomonas aeruginosa Lipid A

Principal Investigator: Samuel I. Miller, M.D.

Agency: NIH

Type: RO1 AI47938, Period: 4/1/01-3/31/06

The major goal is defining genes important for the synthesis of CF-specific lipid A in *Pseudomonas aeruginosa*.

Cystic Fibrosis Foundation Research and Development Project

Director: Samuel I. Miller, M.D. Associate Director: Bonnie Ramsey, M.D.

Agency: Cystic Fibrosis Foundation

Period: 10/1/2002-9/30/2005

The major goal of this project is to promote research in CF at the UW through funding of pilot and feasibility projects and postdoctoral fellowships.

WWAMI RCE for Biodefense and Emerging Infectious Diseases

Director: Samuel I. Miller, M.D. Associate Director: Walter Stamm, M.D.

Agency: NIH

Period: 9/4/03-2/29/08

This is a multi-project research center funded by the NIH for biodefense and emerging infectious disease studies.

P. aeruginosa as a surrogate marker of cystic fibrosis

Agency: NIDDK

Type: RO1 DK64954-01A1; Period: 7/1/04 – 5/31/07

This proposal will establish prevalence and clinical correlations for the characteristics associated with adaptation to the CF airway by performing cross-sectional and longitudinal studies on CF children with disease of varying severity.

Completed Research Support

Post genomic study of *Pseudomonas aeruginosa* in CF airways

Principal Investigator / Project Director: Samuel I. Miller, M.D.

Additional Principal Investigators: Stan Fields, Maynard Olson, Jane Burns, Colin Manoil, Bonnie Ramsey

Agency: Cystic Fibrosis Foundation

Period: 10/1/01-9/30/04

The major goal is genome-based analysis of clinical resources of Cystic Fibrosis *P. aeruginosa* isolates to advance knowledge of PA adaptation to the CF airway, including understanding how the CF immune system recognizes the organism, in the hope that this knowledge will direct development of new antibiotics for CF patients.

Add book chapters: new harrisons, mandel,