

## CURRICULUM VITAE

JOSEPHINE E. CLARK-CURTISS

Professor  
University of Florida, Gainesville, FL

### EDUCATION:

St. Mary's College, Notre Dame, IN	B.S.	1968	Biology
Medical College of Georgia, Augusta, GA	Ph.D.	1974	Microbiology

### PROFESSIONAL CAREER:

1968-1969	Graduate Assistant, Dept. of Cell and Molecular Biology,
1970-1973	Medical College of Georgia, Augusta, GA
1969-1970	USPHS Training Grant Fellow, Dept. of Microbiology, Medical College of Georgia, Augusta, GA
1973-1974	USPHS Postdoctoral Trainee, Dept. of Microbiology, University of Alabama in Birmingham, AL
1974	Visiting Instructor, Universidad de Los Andes, Merida, Venezuela
1974-1976	Postdoctoral Trainee, Dept. of Microbiology, University of Alabama in Birmingham, AL
1976-1979	Research Associate, Dept. of Microbiology, University of Alabama in Birmingham, AL
1979-1982	Senior Research Associate, Dept. of Microbiology, University of Alabama in Birmingham, AL
1982-1983	Research Assistant Professor, Dept. of Microbiology, University of Alabama in Birmingham, AL
1983-1990	Research Assistant Professor, Dept. of Microbiology and Immunology, Washington University, St. Louis, MO (Primary Appointment)
1983-1990	Research Assistant Professor, Dept. of Biology, Washington University, St. Louis, MO (Secondary Appointment)
1990-1994	Research Associate Professor, Dept. of Molecular Microbiology, Washington University, St. Louis, MO (Primary Appointment)
1990-1994	Research Associate Professor, Dept. of Biology, Washington University, St. Louis, MO (Secondary Appointment)
1994-2003	Research Associate Professor, Dept. of Biology, Washington University, St. Louis, MO (Primary Appointment)
1994-2004	Research Associate Professor, Dept. of Molecular Microbiology, Washington University, St. Louis, MO (Secondary Appointment)
2003-2005	Research Professor, Dept. of Biology, Washington University, St. Louis, MO (Primary Appointment)
2004-2005	Research Professor, Dept. of Molecular Microbiology, Washington University, St. Louis, MO (Secondary Appointment)
2004-2015	Professor, School of Life Sciences and The Biodesign Institute, Arizona State University, Tempe, AZ

- 2015-present Professor Emeritus, School of Life Sciences, Arizona State University, Tempe, AZ
- 2015-present Professor, Dept. of Medicine, Division of Infectious Diseases and Global Health, College of Medicine, University of Florida, Gainesville, FL

**HONORS:**

- 1969 President's Fellowship, American Society for Microbiology, Summer
- 1986-1991 Member, Leprosy Panel of the Joint U.S.-Japan Cooperative Medical Sciences Program
- 1990-1991 Chair-elect, Division U (Mycobacteriology), American Society for Microbiology
- 1991-1992 Chair, Division U (Mycobacteriology), American Society for Microbiology
- 1990-1998 Member, International Committee on Systematic Bacteriology
- 1991-2002 Member, Editorial Board, Infection and Immunity
- 1995-1999 Member, Bacteriology and Mycology Study Section 1, USHHS PHS National Institutes of Health
- 2002-2004 Alternate Councilor, Division U (Mycobacteriology), American Society for Microbiology
- 2003 Member, Evaluation Committee for the Department of Microbial Pathogenesis, Institut Pasteur, Paris, France
- 2004-2006 Councilor, Division U (Mycobacteriology), American Society for Microbiology
- 2006-2008 Member, Topics in Bacterial Pathogenesis Study Section, USHHS PHS National Institutes of Health
- 2007-2012 Faculty Leader, Cellular and Molecular Biosciences Faculty, School of Life Sciences, Arizona State University
- 2007-2012 Member, Executive Committee, School of Life Sciences, Arizona State University
- 2008 Member, Site Visit Evaluation Committee for Dept. of Genetics and Genomics, Institut Pasteur
- 2009 Member, National Institutes of Health Special Study Sections to review ARRA applications
- 2010-2012, 2015 Member, National Institutes of Health Study Section ZRG1 F-13C

**SOCIETIES:**

- 1969-present American Society for Microbiology
- 1981-present International Leprosy Association
- 1973-present Sigma Xi

**GRANT SUPPORT (PAST):**

NIH, NO1 AI 72533, "Processing and Packaging of Recombinant DNA Host-Vector Systems,"  
10/01/77 – 01/02/81, PI, 50% effort, total direct support was approximately \$100,000 to \$120,000.

World Health Organization, "Genetic Analysis of *Mycobacterium leprae*," Co-PI, 100% effort, 1981-1986, total direct support, \$235,190.

NIH, BRSG SO7 RR07054-22, "Analysis of Antigenic Determinants of *Mycobacterium leprae*," PI, 25% effort, 04/01/87 - 03/31/88, total direct support, \$6,675.

NIH, R22-AI23470, "*Mycobacterium leprae* Taxonomy and Genetics," PI, 75% effort, 12/01/86 - 11/30/89, total direct support, \$209,246.

NIH, R22-AI26186, "Induction of Immunity to *Mycobacterium leprae*," PI, 25% effort, 04/01/88 - 03/31/91; total direct support, \$223,591.

NIH, R01-AI23470, "*Mycobacterium leprae* Taxonomy and Genetics," PI, 75% effort. 12/01/89 - 11/30/93; total direct support, \$434,224.

NIH, R01-AI35267, "Virulence Determinants of *Mycobacterium tuberculosis*", PI, 50% effort, 9/30/93 - 8/31/96, total direct support, \$349,386.

NIH, NIAID-DMID-94-22, TB Control and Prevention Research Unit, PI of Subcontract, "Differentially Expressed Genes of *Mycobacterium tuberculosis*"; 5% effort, 9/30/94 – 9/30/98, total direct support, \$62,342.

NIH, R42 AI40446, "Recombinant Avirulent Salmonella Vaccines Against TB," PI, 10% effort, 09/30/96 – 03/29/98, total direct support, \$84,853.

NIH, RO1 AI 38672, "*Mycobacterium avium* Mechanisms of Pathogenesis", PI, 50% effort, 09/30/95 - 07/31/01.

NIH, RO1 AI 24533, "Molecular Genetic Analysis of *Salmonella* Pathogenicity," Co-Investigator (Roy Curtiss III, PI), 10% effort, 06/01/02 – 05/31/05, total direct support, \$1,150,000.

NIH, RO1 AI 46428, "Gene Expression in *Mycobacterium tuberculosis*," PI, 50% effort, 02/01/00 – 11/30/11, total direct support (current period), \$1,125,000.

Arizona Community Foundation: "High-throughput Substrate Profiling for *Mycobacterium tuberculosis* Protein Kinase K using Nucleic Acid Programmable Protein Array (NAPPA) Technology" (Support research which may lead to new antibiotics for Tuberculosis), Co-PI (V. Malhotra, Co-PI), 5% effort, 11/01/2011 – 11-30-2012, total direct support, \$20,184.00

**GRANT SUPPORT (PRESENT):**

NIH, RO1 AI 56289-12, "Recombinant Attenuated *Salmonella* Vaccines for Humans," Co-PI (R. Curtiss III, Co-PI), 25% effort, 07/01/14 - 06/30/19, total direct support, \$1,479,851.

**GRANT SUPPORT (PENDING):**

NIH, RO1, "Recombinant Attenuated *Salmonella* Vaccines Against Carbapenum-Resistant *Enterobacteriaceae*." PI, 25% effort.

NIH, RO1, "*Salmonella* Vaccines to Enhance Neonatal and Infant Intestinal Health and Lessen Diarrheal Diseases", Co-Investigator, 10% effort (R. Curtiss III, PI).

NIH, RO1, "Recombinant Attenuated *Salmonella* Vaccines Against *Yersinia pestis*, Co-Investigator, 5% effort (R. Curtiss III, Co-PI, W. Sun, Co-PI).

**PUBLICATIONS:****A. Peer-reviewed:**

1. **Clark, J.E.** and G.H. Brownell. 1972. Genophore homologies among compatible nocardiae. *J. Bacteriol.* **109**: 720-729.
2. Bradley, S.G., G.H. Brownell, and **J.E. Clark.** 1973. Genetic homologies among nocardiae and other actinomycetes. *Can. J. Microbiol.* **19**: 1007-1014.
3. Brownell, G.H. and **J.E. Clark.** 1974. Lysogenization of *Nocardia erythropolis* by nocardiphage  $\phi$ C followed by a host-range alteration. *J. Gen. Virol.* **23**: 247-254.
4. Jacobs, W.R., **J.E. Clark-Curtiss**, L.R. Ritchie, and R. Curtiss III. 1983. Construction and partial characterization of *Mycobacterium leprae* genomic libraries using an in vivo cosmid cloning system. *Intl. J. Lepr.* **51**: 667-668.
5. **Clark-Curtiss, J.E.**, W.R. Jacobs, M.A. Docherty, L.R. Ritchie, and R. Curtiss III. 1985. Molecular analysis of DNA and construction of genomic libraries of *Mycobacterium leprae*. *J. Bacteriol.* **161**: 1093-1102.
6. Young, R.A., V. Mehra, D. Sweetser, T. Buchanan, **J. Clark-Curtiss**, R.W. Davis, and B.R. Bloom. 1985. Genes for the major protein antigens of *Mycobacterium leprae*. *Nature* **316**: 450-452.
7. Jacobs, W.R., J.F. Barrett, **J.E. Clark-Curtiss**, and R. Curtiss III. 1986. In vivo repackaging of recombinant cosmid molecules for analyses of *Salmonella typhimurium*, *Streptococcus mutans* and mycobacterial genomic libraries. *Infect. Immun.* **52**: 101-109.
8. Jacobs, W.R., M.A. Docherty, R. Curtiss III, and **J.E. Clark-Curtiss.** 1986. Expression of *Mycobacterium leprae* genes from a *Streptococcus mutans* promoter in *Escherichia coli* K-12. *Proc. Natl. Acad. Sci. USA.* **83**: 1926-1930.
9. **Clark-Curtiss, J.E.** and M.A. Docherty. 1989. A species-specific repetitive sequence in *Mycobacterium leprae* DNA. *J. Inf. Dis.* **159**: 7-15.
10. Sela, S., **J.E. Clark-Curtiss**, and H. Bercovier. 1989. Characterization and taxonomic implications of the rRNA genes of *Mycobacterium leprae*. *J. Bacteriol.* **171**: 70-73.
11. Grosskinsky, C.M., W.R. Jacobs, Jr., **J.E. Clark-Curtiss**, and B.R. Bloom. 1989. Genetic relationships between *Mycobacterium leprae*, *Mycobacterium tuberculosis* and candidate leprosy vaccine strains by DNA hybridization: Identification of an *M. leprae*-specific repetitive sequence. *Infect. Immun.* **57**: 1535-1541.
12. **Clark-Curtiss, J.E.** and G.P. Walsh. 1989. Conservation of genomic sequences among isolates of *Mycobacterium leprae*. *J. Bacteriol.* **171**: 4844-4851.

13. Sathish M., R.E. Esser, J.E.R. Thole, and **J.E. Clark-Curtiss**. 1990. Identification and characterization of antigenic determinants of *Mycobacterium leprae* that react with antibodies in leprosy patients' sera. *Infect. Immun.* **58**: 1327-1336.
14. **Clark-Curtiss, J.E.**, J.E.R. Thole, M. Sathish, B.A. Bosecker, S. Sela, E.F. de Carvalho, and R.E. Esser. 1990. Protein antigens of *Mycobacterium leprae*. *Res. Microbiology* **141**: 859-871.
15. Sela, S. and **J.E. Clark-Curtiss**. 1991. Cloning and characterization of the promoter of the 16S ribosomal RNA gene of *Mycobacterium leprae*. *Gene* **98**: 123-127.
16. Sela, S., J.E.R. Thole, T.H.M. Ottenhoff, and **J.E. Clark-Curtiss**. 1991. Identification of *Mycobacterium leprae* antigens from a cosmid library: characterization of a 15 kDa antigen that is recognized by both the humoral and cellular immune systems in leprosy patients. *Infect. Immun.*, **59**: 4117-4124.
17. Thole, J.E.R., R. Schoningh, A.A.M. Janson, T. Garbe, **J.E. Clark-Curtiss**, A.H.J. Kolk, T.H.M. Ottenhoff, R.R.P. deVries and C. Abou-Zeid. 1992. Molecular and immunological analysis of a fibronectin-binding protein antigen secreted by *Mycobacterium leprae*. *Molec. Microbiol.* **6**: 153-163.
18. Wagner, B., P.G. Atrat, **J.E. Clark-Curtiss**, and M. Wagner. 1992. Localization of the steroid-1-dehydrogenase in *Rhodococcus erythropolis* IMET 7030 by immunoelectron microscopy. *J. Basic Microbiol.* **32**:65-71.
19. Wagner, M., P.G. Atrat, B. Wagner, V. Haneman, and **J.E. Clark-Curtiss**. 1992. Overexpression of a *Rhodococcus erythropolis* protein in *Escherichia coli* with immunological identity to the *Rhodococcus* steroid 1-dehydrogenase. Immunoelectron microscopic localization and electrophoretic studies. *J. Basic Microbiol.* **32**: 269-277.
20. Jagusztyn-Krynicka, E.K., **J.E. Clark-Curtiss** and R. Curtiss III. 1993. *Escherichia coli* heat-labile toxin subunit B fusions with *Streptococcus sobrinus* antigens expressed by *Salmonella typhimurium* oral vaccine strains: importance of the linker for antigenicity and biological activities of the hybrid proteins. *Infect. Immun.* **61**:1004-1015.
21. Rinke de Wit, T.F., **J.E. Clark-Curtiss**, F. Abebe, A.H.L. Kolk, A.A.M. Janson, and J.E.R. Thole. 1993. A *Mycobacterium leprae*-specific gene encoding an immunologically recognized 45 kDa protein. *Molec. Microbiol.* **10**:829-838.
22. Plum, G. and **J.E. Clark-Curtiss**. 1993. Detection of genes expressed by *Mycobacterium avium* growing in human macrophages. *Infect. Agents & Disease.* **2**:279-281.
23. Wieles, B., M. van Agterveld, A. Janson, **J. Clark-Curtiss**, T. Rinke de Wit, M. Harboe and J. Thole. 1994. An antigenic protein secreted by *Mycobacterium leprae*: a homologue of *Mycobacterium tuberculosis* MPT 32. *Infect. Immun.* **62**:252-258.

24. Plum, G. and **J.E. Clark-Curtiss**. 1994. Induction of *Mycobacterium avium* gene expression following phagocytosis by human macrophages. *Infect. Immun.* **62**:476-483.
25. Schorey, J.S., Q. Li, D.W. McCourt, M. Bong-Mastec, **J.E. Clark-Curtiss**, T. L. Ratliff, and E. J. Brown. 1995. A *Mycobacterium leprae* gene required for efficient invasion of Schwann cells encodes a fibronectin-binding protein. *Infect. Immun.* **63**:2652-2657.
26. Thole, J.E.R., B. Wieles, **J.E. Clark-Curtiss**, T. H. M. Ottenhoff, and T. F. Rinke de Wit. 1995. Immunological and functional characterization of *Mycobacterium leprae* protein antigens: an overview. *Molec. Microbiol.* **18**:791-800
27. **Clark-Curtiss, J.E.**, and G. Plum. 1996. Induction of mycobacterial gene expression during growth in human macrophages. *Acta. Microbiol. Polonica.* **44**:245-254.
28. Plum, G., M. Brenden, **J.E. Clark-Curtiss**, and G. Pulverer. 1997. Cloning, sequencing and expression of the *mig* gene of *Mycobacterium avium* coding for a secreted, macrophage-induced protein. *Infect. Immun.* **65**:4548-4557.
29. Graham, J.E., and **J.E. Clark-Curtiss**. 1999. Identification of *Mycobacterium tuberculosis* RNAs synthesized in response to phagocytosis by human macrophages by selective capture of transcribed sequences (SCOTS). *Proc. Natl. Acad. Sci. USA* **96**: 11554-11559.
30. Haydel, S.E., W.H. Benjamin, Jr., N.E. Dunlap, and **J.E. Clark-Curtiss**. 2002. Expression, autoregulation, and DNA binding properties of the *Mycobacterium tuberculosis* TrcR response regulator. *J. Bacteriol.* **184**: 2192-2203.
31. Hou, J.Y., J.E. Graham, and **J.E. Clark-Curtiss**. 2002. Gene expression in *Mycobacterium avium* during growth in human macrophages. *Infect. Immun.* **70**: 3714-3726.
32. Haydel, S.E. and **J.E. Clark-Curtiss**. 2004. Global analysis of two-component system regulator genes during *Mycobacterium tuberculosis* growth in human macrophages. *FEMS Microbiol. Lett.* **236**: 341-347.
33. Haydel, S.E. and **J.E. Clark-Curtiss**. 2006. The *Mycobacterium tuberculosis* TrcR response regulator represses the expression of a seven-bladed  $\beta$ -propeller protein. *J. Bacteriol.* **188**: 150-159.
34. Malhotra, V., J.S. Tyagi, and **J.E. Clark-Curtiss**. 2009. DevR-mediated adaptive response in *Mycobacterium tuberculosis* H37Ra: Links to asparagine metabolism. *Tuberculosis (Edinb.)* **89**: 211-217.
35. Korch, S.B. H. Contreras and **J.E. Clark-Curtiss**. 2009. Three *Mycobacterium tuberculosis* Rel toxin-antitoxin modules inhibit mycobacterial growth and are expressed in infected human macrophages. *J. Bacteriol.* **191**: 1631-1640.

36. Malhotra, V., L.T. Arteaga-Cortes, G. Clay and **J.E. Clark-Curtiss**. 2010. *Mycobacterium tuberculosis* protein kinase K confers survival advantage during early infection in mice and regulates growth in culture and during persistent infection: Implications for immune modulation. *Microbiology* **156**: 2829-2841.
37. Zhao, G., W. Kong, N. Weatherspoon-Griffin, **J. Clark-Curtiss** and Y. Shi. 2011. Mg<sup>2+</sup> facilitates leader peptide translation to induce riboswitch-mediated transcription termination. *The EMBO Journal* **30**: 1485-1496.
38. Haydel, S.E., V. Malhotra, G.L. Cornelison and **J.E. Clark-Curtiss**. 2012. The PrrAB two-component system is essential for *Mycobacterium tuberculosis* viability and is induced under nitrogen-limiting conditions. *J. Bacteriol.* **194**: 346-361.
39. Juarez-Rodriguez, M.D., L.T. Arteaga-Cortes, R. Kader. R. Curtiss III and **J.E. Clark-Curtiss**. 2012. Live attenuated *Salmonella* vaccines against *Mycobacterium tuberculosis*: Antigen delivery via Type III secretion. *Infect. Immun.* **80**: 798-814.
40. Juarez-Rodriguez, M.D., J. Yang, R. Kader, P. Alamuri, R. Curtiss III and **J.E. Clark-Curtiss**. 2012. Live attenuated *Salmonella* vaccine displaying regulated delayed lysis and delayed antigen synthesis to confer protection against *Mycobacterium tuberculosis*. *Infect. Immun.* **80**: 815-831.
41. Malhotra, V., B.P. Okon and **J.E. Clark-Curtiss**. 2012. *Mycobacterium tuberculosis* protein kinase K enables growth adaptation through translation control. *J. Bacteriol.* **194**: 4184-4196.
42. Kong, W., M. Brovold, B.A. Koeneman, **J.E. Clark-Curtiss** and R. Curtiss III. 2012. Turning self-destructing *Salmonella* into a universal DNA vaccine delivery platform. *Proc. Natl. Acad. Sci. USA.* **109**:19414-19419. PMID: 23129620.  
(Recommended as being of special significance in its field by the Faculty of 1000)
43. Dankel, D.J., C-H. Baek, K. Brenneman, A. Delgado, M. Fisher, K. Roland, J. Santander, **J. Clark-Curtiss**, R. Strand, and R. Curtiss III. 2014. Making Common sense of vaccines: An example of discussing the Recombinant Attenuated Salmonella Vaccine with the public. *Nanoethics.* **8**:179-185.
44. Malhotra, V., R. Agarwal, T.R. Duncan, D.K. Saini and **J.E. Clark-Curtiss**. 2015. *Mycobacterium tuberculosis* response regulators DevR and NarL interact in vivo and co-regulate gene expression during aerobic nitrate metabolism. *J. Biol. Chem.* Doi:10.1074/jbc.M114.591800.
45. Korch, S.B., V. Malhotra, H. Contreras and **J.E. Clark-Curtiss**. 2015. The *Mycobacterium tuberculosis* *reiBE* toxin-antitoxin are stress-responsive modules that regulate growth through translation inhibition. *J. Microbiol.* **53**:783-795.

## **B. Invited Publications:**

1. Curtiss, R. III, D.A. Pereira, J.C. Hsu, S.C. Hull, **J.E. Clark**, L.J. Maturin, Sr., R. Goldschmidt, R. Moody, M. Inoue, and L. Alexander. 1976. Biological containment: The subordination of *Escherichia coli* K-12. p. 45-56. In: R.F. Beers, Jr. and E.G. Bassett (ed.), Recombinant Molecules: Impact on Science and Society, Tenth Miles International Symposium.
2. Curtiss, R. III, **J.E. Clark**, R. Goldschmidt, J.C. Hsu, S.C. Hull, M. Inoue, L.J. Maturin, Sr., R. Moody, and D.A. Pereira. 1977. Biohazard Assessment of recombinant DNA molecule research. p. 375- 387. In: S. Mitsuhashi, L. Rosival, and V. Krcmery (ed.), Plasmids: Medical and Theoretical Aspects. Avicenum Press, Prague.
3. Curtiss, R. III and **J.E. Clark-Curtiss**. 1977. Effectiveness of physical and biological containment, p. 198-202. In: Research with Recombinant DNA. National Academy of Sciences, Washington, DC
4. **Clark-Curtiss, J.E.** and R. Curtiss III. 1983. Analysis of recombinant DNA using *Escherichia coli* minicells. p. 347-361. In: R. Wu, L. Grossman, and K. Moldave (ed.), Meth. Enzymol., Vol. 101. Academic Press, N.Y.
5. **Clark-Curtiss, J.E.** 1988. The benefits of recombinant DNA technology for the study of *Mycobacterium leprae*. Curr. Top. Microbiol. Immunol. **138**: 61-79.
6. **Clark-Curtiss, J.E.** 1990. Genome structure of mycobacteria. p. 77-96. In: J.J. McFadden (ed.), The Molecular Biology of the Mycobacteria. Academic Press, London.
7. **Clark-Curtiss, J.E.** 1997. Identification of virulence determinants in pathogenic mycobacteria. Curr. Top. Microbiol. Immunol. **225**:57-79.
8. Daigle, F., J.Y. Hou, and **J.E. Clark-Curtiss**. 2002. Microbial gene expression elucidated by selective capture of transcribed sequences (SCOTS). Meth. Enz. **358**: 108-122.
9. **J.E. Clark-Curtiss** and S.E. Haydel. 2003. Molecular genetics of *Mycobacterium tuberculosis* pathogenesis. Annu. Rev. Microbiol. **57**: 517-549.
10. **J.E. Clark-Curtiss** and L.E. DesJardin. 2004. Analysis of *Mycobacterium tuberculosis* gene expression in the human host. pp. 187-226. In: L.S. Schlesinger and L.E. DesJardin (ed), Tuberculosis: The Microbe:Host Interface. Horizon Bioscience, Norfolk, UK.
11. Cangelosi, G., **J.E. Clark-Curtiss**, M. Behr, T. Bull, and T. Stinear. 2004. Biology of waterborne pathogenic mycobacteria. pp. 39-54. In: S. Pedley, J. Bartram, G. Rees, A. Dufour, and J.A. Cotruvo (ed.), Pathogenic Mycobacteria in Water, World Health Organization, IWA Publishing, London, UK.



12. Kong, W., **J.E. Clark-Curtiss** and R. Curtiss 3<sup>rd</sup>. 2013. Utilizing *Salmonella* for antigen delivery: the aims and benefits of bacterial delivered vaccination. *Expert Rev. Vaccines* **12**: 345-347.

### **INVITED PRESENTATIONS:**

September 8-10, 1988: Workshop on Immunology, held in conjunction with the XIIIth International Leprosy Congress, The Hague, The Netherlands.

May 15, 1989: Molecular Genetic Approaches to the Study of Mycobacteria Seminar, American Society for Microbiology Annual Meeting, New Orleans, LA.

June 27, 1989: Fifth International Symposium of the World Association of Veterinary Diagnosticians, Guelph, Ontario, Canada.

July 24-28, 1989: Session Leader at the Gordon Conference on Population Biology and Evolution of Microorganisms, Plymouth, N.H.

September 7-9, 1989: Symposium on the Molecular Biology of the Mycobacteria, Surrey, Great Britain.

April 25-26, 1990: Joint Meeting of the Immunology of Leprosy (IMMLEP), Immunology of Tuberculosis (IMMTUB), and Chemotherapy of Leprosy (THELEP) Scientific Working Groups, World Health Organization, Geneva, Switzerland.

June 5-7, 1990: Workshop on Oral Immunization with Recombinant Bacteria, Munich, West Germany.

September 17-22, 1990: Symposium on Recent Developments in the Molecular Biology and Diagnosis of Leprosy and Paratuberculosis at the International Union of Microbiological Societies (IUMS) Congress: Bacteriology and Mycology, Osaka, Japan.

February 8, 1991: Department of Microbiology, Colorado State University, Fort Collins, CO

February 22-23, 1993: First Bristol-Myers Squibb Symposium on Infectious Diseases Research: The Cell and Molecular Biology of Bacterial-Host Cell Interactions, Monterey, CA.

July 18, 1993: Workshop on Rapid Diagnosis of Tuberculosis, Bethesda, MD.

July 19-21, 1993: Twenty-eighth Joint U.S.-Japan Leprosy and Tuberculosis Conference, Bethesda, MD.

August 26-27, 1993: Workshop on Immunology, held in conjunction with the XIVth International Leprosy Congress, Orlando, FL.

March 11-13, 1994: Conference on Reestablishing Control of Tuberculosis in the U.S., Washington, D.C.

April 12, 1994: Department of Microbiology, Harvard University Medical School, Boston, MA.

July 17-22, 1994: Gordon Research Conference on Microbial Toxins and Pathogenicity, Procter Academy, Andover, NH

February 19-25, 1995: Keystone Symposium: Molecular Mechanisms in Tuberculosis, Tamarron, CO.

May 7, 1995: Department of Veterinary Microbiology, University of Missouri, Columbia, MO

May 23, 1995: Seminar on Molecular Analysis of Mycobacterial Virulence Determinants, American Society for Microbiology General Meeting, Washington, DC.

September 19, 1995: Department of Medical Research, Veterans' Administration Medical Center. Long Beach, CA

February 1, 1996: Department of Microbiology, The University of Texas Health Science Center at San Antonio, TX

October 26, 1996: Seminar on Environmental Regulation of Virulence, Third Annual Midwest Pathogenesis Conference, Madison, WI

May 8, 1997: Convener and Presenter, Symposium on Future Prospects: Tuberculosis Vaccine Development. American Society for Microbiology General Meeting, Miami Beach, FL

July 10, 1997: Convener, Session on Mechanisms of Mycobacterial Pathogenesis, American Society for Microbiology Conference on Tuberculosis: Past, Present, And Future, Copper Mountain, CO

April 4, 1998: Session on Virulence Determinants, Keystone Symposium on Opportunistic Infections in AIDS, Keystone, CO

June 30, 1999: Thirty-fourth Joint US-Japan Tuberculosis and Leprosy Research Conference, San Francisco, CA

February 18, 2000: Department of Microbiology and Immunology, University of Arizona Medical Center, Tucson, AZ

June 21, 2000: Convener and Presenter, Session on Genetics and Genomics, American Society for Microbiology Conference on Tuberculosis 2000: Past, Present and Future, New York, NY

March 6, 2001: Department of Microbiology and Immunology, The University of Texas Medical Branch at Galveston, TX

September 18-20, 2002: EPA/WHO Workshop on *Mycobacterium avium-intracellulare* Complex (MAC) in Drinking Water, Guildford, UK

April 8, 2003: Department of Medical Microbiology and Immunology, School of Medicine, University of Minnesota, Duluth, MN

April 18, 2003: Department of Microbiology, Southern Illinois University, Carbondale, IL

November 12, 2003: Advanced Bacterial Genetics Course, Department of Microbiology, University of Alabama at Birmingham, AL

February 3, 2004: Department of Biochemistry, University of Texas Health Science Center, Tyler, TX

May 10, 2004: Center for the Study of Host Resistance, McGill University, Montreal, Canada.

October 2, 2011: Fifth Vaccine and International Vaccine Society Annual Global Congress, Seattle, WA

November 18, 2013: College of Veterinary Medicine, Cornell University, Ithaca, NY

November 24, 2013: Facultad de Ciencias Biologicas, Pontifica Universidad Catolica de Chile, Santiago, Chile

November 25, 2013: Facultad de Ciencias Biologicas, Universidad Mayor, Santiago, Chile.

October 13, 2015: Department of Molecular Genetics and Microbiology, College of Medicine, University of Florida, Gainesville, FL.

October 27, 2015: Department of Infectious Diseases and Pathology, College of Veterinary Medicine, University of Florida, Gainesville, FL.

### **COURSES TAUGHT:**

#### **ASU:**

BIO 189: Life Sciences Career Paths (Fall semesters: 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2014)

MIC 220: Biology of Microorganisms (Spring semesters: 2006, 2007, 2008, 2009, 2010)

MIC 302: Advanced Bacteriology Lab (Spring, 2011; Fall, 2011)

MIC 360: Bacterial Physiology (Spring, 2013)

MIC/BIO 494: Bacterial Pathogens Interactions with Hosts (Spring, 2014)

MIC 591: Milestones in Microbiology (Graduate course): (Fall, 2008; Fall, 2010)

MCB 501/701: MCB Colloquium (Graduate course): (Fall and Spring semesters: 2006, 2007, 2008, 2009, 2010)

### **TRAINING OF PREDOCTORAL AND POSTDOCTORAL STUDENTS:**

#### **CURRENT POSTDOCTORAL TRAINEE:**

**Hedwin Kitdorlang Dkhar**

Postdoctoral Trainee, 2015-present

Ph.D., 2014, Institute of Microbial Technology, Jawaharlal Nehru University, New Delhi, India

Research Project: Improvements in Recombinant Attenuated *Salmonella* Vaccines against *Mycobacterium tuberculosis*.

## **PREVIOUS TRAINEES:**

### **Predoctoral:**

#### **William R. Jacobs, Jr.**

Predoctoral Trainee, 1980-1985 (Univ. Alabama in Birmingham and W.U)

B.A. Edinboro State University, Edinboro, PA

Ph.D., 1985, University of Alabama in Birmingham

Research Project: Construction and analyses of genomic libraries of *Mycobacterium leprae* DNA

Current Position: Investigator, Howard Hughes Medical Institute and Professor, Departments of Microbiology and Immunology and of Molecular Genetics Albert Einstein College of Medicine of Yeshiva University, New York, NY.

Elected to the U.S. National Academy of Sciences, 2013.

### **Postdoctoral:**

#### **Jeffrey L. Adams**

Postdoctoral Trainee, 1993-1995

B.S., Bowling Green State College, Bowling Green, OH

M.S., University of Wisconsin, Madison, WI

Ph.D., 1993, University of Wisconsin, Madison, WI

Research Project: Effects of cytokines on *Mycobacterium tuberculosis* gene expression.

Current Position: Scientist, Sigma Aldrich Chemical Co., St. Louis, MO

#### **Peter G. Atrat**

Visiting Professor, 1988-1989

Ph.D., 1973, Friedrich Schiller University, Jena, Germany

Dr.sc., 1987, Academy of Sciences of the German Democratic Republic

Research Project: Investigation of the steroid transforming microbial strains *Nocardia opaca*, *Nocardia erythropolis*, *Mycobacterium phlei*, *Mycobacterium vaccae*, and *Mycobacterium fortuitum* by recombinant DNA techniques

Last known position: Head of the Department of Molecular Steroid Biochemistry, Division of Steroid Research, Academy of Sciences of the German Democratic Republic, ZIMET

(After the reunification of Germany, I have not heard from Dr. Atrat)

#### **John D. Dunkle**

Postdoctoral Trainee, 1988-1989

B.A. Vanderbilt University, Nashville, TN

M.D., 1985, University of Alabama in Birmingham

Research Project: Molecular characterization of the unique repetitive sequence

in the *Mycobacterium leprae* genome.  
Current Position: Physician in private practice, Huntsville, AL

**Ronald E. Esser**

Postdoctoral Trainee, 1984-1986  
B.S., University of Missouri, Columbia, MO  
Ph.D., 1983, University of North Carolina, Chapel Hill, NC  
Research Project: Identification and characterization of antigenic determinants of *Mycobacterium leprae* recognized by leprosy patients' sera  
Current Position: Senior Scientist, Hoechst Marion Roussel, Inc., Cincinnati, OH

**James E. Graham**

Postdoctoral Trainee, 1995-1999  
B.S., University of Illinois, Champaign-Urbana, IL  
M.S., 1988, Illinois State University, Chicago, IL  
Ph.D., 1995, Indiana University, Bloomington, IN  
Research Project: Identification and characterization of genes expressed by *Mycobacterium tuberculosis* during growth in human macrophages  
Current Position: Associate Professor, Department of Microbiology and Immunology, University of Louisville, Louisville, KY

**Richard K. Groger**

Postdoctoral Trainee, 2000-2003  
B.A., Harvard University, Cambridge, MA  
M.D., 1990, Case Western Reserve University, Cleveland, OH  
Ph.D., 1992, Case Western Reserve University, Cleveland, OH  
Research Project: Utilization of avirulent, balanced lethal *Salmonella typhimurium* vaccine strains for delivery of *Mycobacterium tuberculosis* antigens as a vaccine development strategy  
Current Position: Physician, The Cleveland Clinics, Cleveland, OH

**Shelley E. Haydel**

Postdoctoral Trainee, 2000-2005  
B.S., Louisiana Tech University, Ruston, LA  
Ph.D., 2000, University of Alabama in Birmingham, AL  
Research Project: Regulation of gene expression controlled by two-component regulatory systems of *Mycobacterium tuberculosis*  
Current Position: Associate Professor, School of Life Sciences and Biodesign Institute, Arizona State University, Tempe, AZ

**Elzbieta K. Jagustyn-Krynicka**

Visiting Assistant Professor, 1989-1991  
Ph.D., 1979 Institute of Microbiology, University of Warsaw, Warsaw, Poland  
Research Project: (1) Development of plasmid vectors that allow construction of fusion proteins between *Escherichia coli* heat-labile toxin subunit B and heterologous antigens for use in *Salmonella typhimurium* vaccine strains and (2) Studies on the biological activities of the fusion proteins.  
Current Position: Professor, Institute of Microbiology, University of Warsaw,

Warsaw, Poland

**Maria Dolores Juárez-Rodríguez**

Postdoctoral Trainee, 2003-2010

B.S., National University of Mexico

M.S., 1993, National University of Mexico

Ph.D., 2002, National University of Mexico

Research Project: Construction and evaluation of recombinant attenuated *Salmonella* vaccine strains expressing *Mycobacterium tuberculosis* antigens.

Current Position: Senior Research Associate, University of Louisville

**Shaleen B. Korch**

Postdoctoral Trainee, 2005-2010

B.S., 1999, University of Winnipeg, Winnipeg, Canada

Ph.D., 2005, University of North Dakota

Research Project: The role of mycobacterial protein synthesis inhibitors in the induction of persistence in *Mycobacterium tuberculosis*.

Current Position: Assistant Professor, Department of Pharmacology, Midwestern College of Osteopathic Medicine, Glendale, AZ.

**Vandana Malhotra**

Postdoctoral Trainee, 2005-2010

Assistant Research Scientist, Clark-Curtiss Research Group, Center for Infectious Diseases and Vaccinology, Biodesign Institute, ASU, 2010-2013

B.S., 1993, Daulat Ram College, University of Delhi, India

M.S., 1995, Madurai Kamaraj University, Madurai, India

Ph.D., 2002, All India Institute of Medical Sciences, New Delhi, India

Research Project: Analyses of regulation of gene expression by two-component regulatory systems and serine-threonine protein kinases in *Mycobacterium tuberculosis*

Current position: Assistant Professor, Department of Biochemistry and Biotechnology, Sri Venkateswara College, University of Delhi, New Delhi, India.

**James A. Megehee, Jr.**

Postdoctoral Trainee, 2005-2010

B.S., 1992, Millsaps College, Jackson, MS

M.S., 1996, Mississippi State University, Mississippi State, MS

Ph.D., 2005, University of Mississippi Medical Center, Jackson, MS

Research Project: The roles of beta-oxidation of fatty acids and nitrate reduction in *Mycobacterium tuberculosis* pathogenesis.

Current Position: Supervisor, Banner Health Systems Clinical Laboratories, Phoenix, AZ.

**Sathish Mundayoor**

Postdoctoral Trainee, 1986-1989

B.Sc. (Honors), University of Bombay, India

M.Sc., University of Bombay, India  
Ph.D., 1984, All-India Institute of Medical Sciences, New Delhi, India  
Research Project: Characterization of antigenic determinants of  
*Mycobacterium leprae* recognized by leprosy patients' sera  
Current Position: Senior Scientist, Rajiv Ghandi Centre for Biotech, New Delhi,  
India

### **Georg Plum**

Postdoctoral Trainee, 1990-1992  
M.D., 1988, University of Aachen, Germany  
Research Project: Investigations on the mechanisms of pathogenicity of HIV-  
associated mycobacteria by molecular biological techniques, with a  
special emphasis on *Mycobacterium avium*: studies on phagocytosis-  
induced gene expression  
Current Position: Professor, Institute for Medical Microbiology  
and Hygiene, University of Cologne, Germany

### **Janusz Popowski**

Visiting Senior Research Associate, 1990-1992  
M.S., University of Warsaw, Poland  
Ph.D., 1974, University of Warsaw, Poland  
Research Projects: (1) Identification and characterization of genes of  
*Mycobacterium leprae* that specify enzymes involved in the biosynthesis  
of lysine and threonine and (2) Characterization of the ATP-dependent  
*clpC* gene of *Mycobacterium leprae*  
Current Position: Chief, Microbial Laboratory, National Food and Nutrition  
Institute, Warsaw, Poland

### **Shlomo Sela**

Postdoctoral Trainee, 1988-1991  
B.Sc., Hebrew University, Jerusalem, Israel  
M.Sc., Hebrew University, Jerusalem, Israel  
Ph.D., 1986, Hebrew University, Jerusalem, Israel  
Research Projects: (1) Molecular analysis of the promoter region of the  
ribosomal RNA operon of *Mycobacterium leprae* and (2) Molecular  
analysis of genes expressing antigenic determinants of *Mycobacterium  
leprae*  
Current Position: Scientist, Food Science Agricultural Research Organization,  
Israeli Ministry of Agriculture, Jerusalem, Israel

**Jelle E.R. Thole**

Postdoctoral Trainee, 1988-1989

B.S., Vrije Universiteit, Amsterdam, The Netherlands

M.S., Vrije Universiteit, Amsterdam, The Netherlands

Ph.D., 1988, Rijksinstituut voor Volksgezondheid en Milieuhygiëne, Bilthoven,  
The Netherlands

Research Project: Identification and characterization of antigenic determinants  
of *Mycobacterium leprae* recognized by leprosy patients' sera

Current Position: Senior Scientist, Department of Bacteriology, Institute for  
Animal and Health Science, Lelystad, The Netherlands

**ADDITIONAL TRAINING:**

The following undergraduate students at Washington University conducted independent research projects (BIO 500) in my laboratory:

Katherine Banghart  
Sharolyn Feldman  
Joseph Galdun  
Michael Jennings  
Daniel Schwartz  
Grant Warmouth

Joseph Galdun, Daniel Schwartz, and Grant Warmouth all went on to attend medical school and are now practicing physicians. Sharolyn Feldman went on to graduate school at the University of Michigan. I have not kept in touch with most of these students to determine their current positions.

The following undergraduate students conducted summer research projects in my laboratory at Washington University:

Jack Bork (University of Wisconsin)  
Sarah E. Jost (Princeton University)  
Matthew Thompson (Harvard University)

The following graduate students conducted rotations in my laboratory during their first years in the Division of Biology and Biomedical Sciences Graduate Program at Washington University:

Susan Francis  
Iglia Pavlova  
Christina Reed  
Amanda Sheets

I served on the Ph.D. Thesis committee of Michelle Michaelski and I served on eight Ph.D. Qualifying Exam committees at Washington University.



The following undergraduate students conducted individual research projects in my laboratory at Arizona State University:

Lindsay Adair  
Awala Awad  
Gwendolyn Clay  
Heidi Contreras  
Kimberly Scull Felker  
Andrew Fontes  
Jennifer Kanc  
Erica Kris  
Kathleen Lucas  
Viridiana Jimenez  
Andrew Rael  
Sofie Schlagintweit  
Ashley Simpson  
David Smith  
Erica Tassone  
Carol Yacavone

The following students were part of the Post-Baccalaureate Research Experiences Program (PREP) at Arizona State University, under my mentorship as members of my research group:

Heidi Contreras (currently: graduate student, University of California, Irvine)  
Tammi Duncan (currently: graduate student, University of New Mexico)  
Blessing Okun (current position: nursing school, University of South Dakota)

I have served or am serving on the Ph.D. Dissertation Committees of the following students at Arizona State University:

Maria Ledesma Barrera  
Stella Chenet  
Tanvi Honap  
Cori Leonetti  
Madive Kalive  
Charlotte Konikoff  
Maria Ledesma Barrera  
Luz-Andrea Pfister  
Silvia Smith  
John Schloendorn  
Catherine Washburn  
Natasha Weatherspoon-Griffin  
Jon Weeks

I am currently serving on the Ph.D. Dissertation Committee of the following students at the University of Florida:

Mohammad Siddiqur Rahman Khan  
Hongbin Wong

**SERVICE:**

**Service at ASU:**

Chair, Search Committee for SoLS faculty member with expertise in *Mycobacterium tuberculosis* research: 2004-2005 (resulted in hiring of Dr. Shelley Haydel).

Member, Search Committee for SoLS faculty member with expertise in Bacterial Pathogenesis: 2005 (resulted in hiring of Dr. Yixin Shi)

Member, Search Committee for Center for Metabolic Biology faculty member (tenure home in SoLS) with expertise in Metabolic Biology: 2005-2006 (resulted in hiring Dr. Tatiana Ugarova)

Member, Search Committee for SoLS faculty members (2) with expertise in Bioenergy: 2006-2007 (resulted in hiring of Dr. Jens Appel and Dr. Roberto Gaxiola)

Co-Chair, Search Committee for SoLS faculty member with expertise in Immunology: 2010-2011 (resulted in hiring of Dr. Joseph Blattman)

Member, Biodesign Institute Committee for Academic Liaisons: 2011 - 2015

Member, Personnel Committee of the Cellular and Molecular Biosciences (CMB) Faculty of SoLS: 2005 - 2015

Chair, Personnel Committee of the CMB Faculty of SoLS: 2007-2012

CMB Faculty Representative to SoLS Research and Training Initiatives Committee: 2005-2007

Member, Microbiology Graduate Program Executive Committee: 2007 – 2015

Member, Molecular Cell Biology Graduate Program Admissions Committee: 2008-2010

Faculty Leader, Cellular and Molecular Biosciences (CMB) Faculty: 2007-2012

Member, SoLS Executive Committee: 2007-2012

Coordinator of Curtiss Lab Select Agent Research and Training, 2013-present.

**Professional Service:**

Ad hoc Reviewer of manuscripts for Journal of Bacteriology, Infection and Immunity, Tuberculosis, FEMS Immunology and Microbiology, Molecular Microbiology, Journal of Infectious Diseases and PLoS One journals (10-15 manuscripts total per year): 2005 – present

Ad hoc Member, Topics in Bacterial Pathogenesis Study Section, National Institutes of Health: 2006-2008

Member, National Institutes of Health Special Study Sections (2) to review ARRA applications: 2009

Ad hoc Member, National Institutes of Health Study Section ZRG1 F-13C: 2010 – 2012, 2015.

Member, Site Visit Evaluation Committee for Department of Genetics and Genomics, Institut Pasteur (Paris, France): 2008

Councilor (and thus Member of the Governing Council) representing Division U (Mycobacteriology) of the American Society for Microbiology: 2004-2006