

CHEMICAL HERITAGE FOUNDATION

**JEFFERY F. MILLER**

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview  
Conducted by

Steven J. Novak

at

University of California, Los Angeles School of Medicine  
Los Angeles, California

on

15, 16, and 17 October 1997

From the Original Collection of the University of California, Los Angeles

## **ACKNOWLEDGEMENT**

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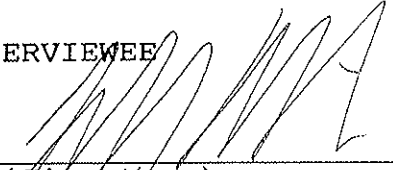
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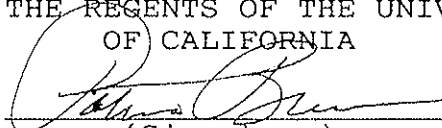
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If to Interviewee: Jeffery F. Miller  
Department of Microbiology & Immunology  
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INTERVIEWEE  
  
\_\_\_\_\_  
(Signature)

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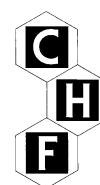
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## JEFFERY F. MILLER

1958 Born in Toledo, Ohio, on 23 December

### Education

1980 B.A., Chemistry and Biology, Case Western Reserve University  
1986 Ph.D., Molecular Biology, Tufts University School of Medicine

### Professional Experience

1985-1989 Stanford University, Palo Alto, California  
Postdoctoral Fellow

University of California, Los Angeles School of Medicine, Los Angeles,  
California

1990-1996 Assistant Professor, Department of Microbiology and  
Immunology

1996-present Associate Professor

1997-present Department Vice Chairman

### Honors

1980 Phi Beta Kappa

1986-1989 Damon Runyon-Walter Winchell Postdoctoral Research Fellowship

1992-1996 Pew Scholar in the Biomedical Sciences

### Selected Publications

Miller, J.F. et al., 1989. Coordinate regulation and sensory transduction in the control of bacterial virulence. *Science* 243:916-22.

Shen, H. et al., 1995. Recombinant *Listeria monocytogenes* as a live vaccine vehicle for the induction of protective anti-viral cell mediated immunity. *Proceedings of the National Academy of Sciences USA* 92:3987-91.

Akerley, B.J. et al., 1995. Ectopic expression of the flagellar regulon alters development of the *Bordetella*-host interaction. *Cell* 80:611-20.

Akerley, B.J. et al., 1996. Understanding signal transduction during bacterial infection. *Trends in Microbiology* 4:141-46.

Uhl, M.A. et al., 1996. Integration of multiple domains in a two-component sensor protein: The

- Bordetella pertussis* BvgS phosphoreley. *EMBO Journal* 15:1028-36.
- Cotter, P.A. et al., 1996. Bacterial-target cell interactions trigger virulence gene expression. *Science* 273:1183-84.
- Uhl, M.A. et al., 1996. Central role of the BvgS receiver as a phosphorylated intermediate in a complex two-component phosphoreley. *Journal of Biological Chemistry* 271:33176-80.
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- Jensen, E.R. et al., 1997. Recombinant *Listeria monocytogenes* a live vaccine vehicle and a probe for studying cell mediated immunity. *Immunological Reviews* (in press).
- Jensen, E.R. et al., 1997. Vaccination with recombinant *Listeria monocytogenes* induces elimination of cottontail rabbit papillomavirus-generated tumors and prevents papilloma formation from viral DNA. *Journal of Virology* 71:(in press).
- Shen, H. et al., 1997. Compartmentalization of bacterial antigens: Differential effects on priming of CD8T cells and protective immunity. *Cell* (in review).



## ABSTRACT

**Jeffery F. Miller** grew up in Toledo, Ohio, the elder of two children. His father was a pediatrician, his mother a nurse and housewife. His parents were devout Roman Catholics, and religion had a strong influence on Miller: he and his father still debate the harmony between science and religion. As a child Miller went to his father's office and was able to study bacteria through a microscope; this is where his interest in medicine in general and in bacteria specifically began. A study he and his father did of *Streptococcus pyogenes* won him a fellowship to spend a summer studying bacterial pathogens at the University of South Carolina School of Medicine.

Miller entered Case Western Reserve University, finishing with a double major in biology and chemistry. Here he talks about fraternity life and his love of motorcycles. Miller's first college classes were large, and he found that he enjoyed college much more when he entered C. Willard Schuster's lab to study plasmid-encoded hemolysin. It happened that he loved the lab and decided to pursue a science rather than a medical career. Most importantly, he met his future wife, Jeanette Polaschek, in college; and here he tells a little about her and her family.

Influenced by Moselio Schaechter, whom he calls "almost larger than life," Miller matriculated into Tufts University School of Medicine. He discusses here his classwork and rotations at Tufts. One of his rotations was with Michael Malamy, whom Miller calls the most rigorous scientist he has ever met, and who eventually became Miller's mentor. In Malamy's lab he studied genetic regulation in *E. coli*. Miller explains the circumstances surrounding his entry into the Stanley Falkow lab at Stanford University School of Medicine; at Stanford he also spent a year in the Lucy S. Tompkins lab. Miller greatly admired Falkow, and in one of their discussions, Miller coined the term "the Zen of pathogenesis." He talks about his debt of gratitude to Lucy S. Tompkins; Falkow's approach to science; and the diversity of research projects in the Falkow lab. Miller studied gene regulation in *Bordetella pertussis*; and then *Bordetella bronchiseptica* in guinea pigs as a model of host-parasite interaction. Miller talks about Falkow's creativity and ability to enlist capable scientists in his lab; Falkow's success at finding jobs for his postdocs; and what it was like to serve as a bacterial genetics consultant at Affymax biotech company.

Miller accepted an assistant professorship at University of California, Los Angeles, with a good start-up package. His lab personnel have been doing research on the molecular biology of transmembrane signaling; his graduate student Brian Akerley has reversed the circuitry regulating virulence and that regulating motility. Miller has developed *Listeria monocytogenes* as a bacterial probe and has been experimenting with viral vaccines. He discusses the prospect of testing the lab's vaccines in humans; obstacles to developing a workable vaccine; his competitors and how designing innovative experiments reduces competition between labs; his plans to study transmission of infections *in vivo*; and his study of bacterial pathogens' interaction with the immune system. Miller's rigorous approach to science infuses his management of his lab.

Miller talks about his funding; science funding in the United States; the benefits of being a Pew scholar; his patent issues; his hopes of partially funding his own research through founding a company; the need for basic research; and how teaching and research are mutually beneficial. He then gets more specific and personal, talking about M.D.'s in the lab; his lab's

publication record and what he construes as reviewer bias in competitive biomedical fields; his own journal review procedure; lab safety and the potential dangers surrounding recent biomedical developments; and the impact their children have had on Miller and his wife. He reverts to his science, explaining the characteristics of bacteria and describing what might be new bacterial epidemics. Miller's mother's affliction with an antibiotic-resistant bacterial strain has increased his desire to find answers. As he points out, there is an increasing number of problems with bacterial food poisoning, to which biodiversity among bacteria contributes; he suggests that solutions might be derived from the *E. coli* genome project. Miller concludes with his philosophy of nature.

## UCLA INTERVIEW HISTORY

### INTERVIEWER:

Steven J. Novak, Senior Editor, UCLA Oral History Program. B.A., History, University of Colorado; Ph.D., History, University of California, Berkeley; M.B.A., UCLA Graduate School of Management.

### TIME AND SETTING OF INTERVIEW:

**Place:** Miller's office, UCLA School of Medicine, Los Angeles.

**Dates, length of sessions:** October 15, 1997 (113 minutes); October 16, 1997 (120); October 17, 1997 (105).

**Total number of recorded hours:** 5.65

**Persons present during interview:** Miller and Novak.

### CONDUCT OF INTERVIEW:

This interview is one in a series with Pew Scholars in the Biomedical Sciences conducted by the UCLA Oral History Program in conjunction with the Pew Charitable Trusts's Pew Scholars in the Biomedical Sciences Oral History and Archives Project. The project has been designed to document the backgrounds, education, and research of biomedical scientists awarded four-year Pew scholarships since 1988.

To provide an overall framework for project interviews, the director of the UCLA Oral History Program and three UCLA faculty consultants developed a topic outline. In preparing for this interview, Novak held a preinterview conversation with Miller to obtain written background information (curriculum vitae, copies of published articles, etc.) and to agree on an interviewing schedule. He also reviewed prior Pew scholars' interviews and the documentation in Miller's file at the Pew Scholars Program office in San Francisco, including his proposal application, letters of recommendation, and reviews by Pew Scholars Program national advisory committee members. For technical background, Novak consulted J.D. Watson et al., *Molecular Biology of the Gene*. 4th ed. Menlo Park, CA: Benjamin/Cummings, 1987 and Bruce Alberts et al., *Molecular Biology of the Cell*. 3d ed. New York: Garland, 1994.

The interview is organized chronologically, beginning with Miller's childhood and continuing through his education at Case Western Reserve University, his graduate studies at Tufts University School of Medicine, and the establishment of his lab at the UCLA School of Medicine. Major topics discussed include bacterial-host interactions, the development of *Listeria monocytogenes* as a bacterial probe, biotech patent issues, Miller's laboratory funding, and his mentors.

### ORIGINAL EDITING:

Jin Ah Lee, editorial assistant, edited the interview. She checked the verbatim transcript of the interview against the original tape recordings, edited for punctuation, paragraphing, and spelling, and verified proper names. Words and phrases inserted by the editor have been bracketed.

Miller reviewed the transcript. He verified proper names and made minor corrections and additions.

William Van Benschoten, editor, prepared the table of contents.

Gregory M.D. Beyrer, editorial assistant, assembled the biographical summary and interview history.

Ödül Bozkurt, editorial assistant, compiled the index.

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