

CHEMICAL HERITAGE FOUNDATION

**MARJORIE A. OETTINGER**

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview  
Conducted by

Andrea R. Maestrejuan

at

Massachusetts General Hospital  
Boston, Massachusetts

on

10, 11, and 12 February 1997

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

## ACKNOWLEDGEMENT

This oral history is part of a series supported by a grant from the Pew Charitable Trusts based on the Pew Scholars Program in the Biomedical Sciences. This collection is an important resource for the history of biomedicine, recording the life and careers of young, distinguished biomedical scientists and of Pew Biomedical Scholar Advisory Committee members.

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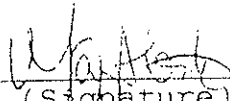
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Boston, MA 02114

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(Signature)

Marjorie A. Oettinger  
(Typed Name)

Department of Molecular Biology  
(Address)

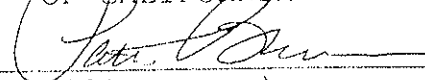
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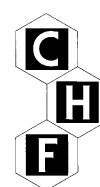
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## MARJORIE A. OETTINGER

1961 Born in Boston, Massachusetts, on 7 December

### Education

1983 A.B., Biochemical Sciences, Harvard University  
1991 Ph.D., Biology, Massachusetts Institute of Technology

### Professional Experience

1979-1984 Harvard Extension and Summer Schools, Cambridge, Massachusetts  
Lecturer of Math

1991-present Harvard College, Cambridge, Massachusetts  
Tutor in Biochemical Sciences

1991-1996 Harvard Medical School, Cambridge, Massachusetts  
Assistant Professor, Department of Molecular Biology and  
Department of Genetics

1996-present Associate Professor

### Honors

1992-1996 Pew Scholar in the Biomedical Sciences  
1996 Leukemia Society Scholar

### Selected Publications

Oettinger, M.A. and K. Struhl, 1985. Suppressors of promoter mutations lacking the *his3* upstream element. *Molecular Cell Biology* 5:1901-9.

Schatz, D.G. et al., 1989. The V(D)J recombination activating gene, RAG-1. *Cell* 59:1035-48.

Oettinger, M.A. et al., 1990. RAG-1 and RAG-2, adjacent genes that synergistically activate V(D)J recombination. *Science* 248:1517-23.

Cuomo, C.A. et al., 1994. Rch1, a protein that specifically interacts with the RAG-1 recombination activating protein. *Proceedings of the National Academy of Sciences USA* 91:6156-60.

Cuomo, C.A. and M.A. Oettinger, 1994. Analysis of regions of RAG-2 important for V(D)J recombination. *Nucleic Acids Research* 22:1810-14.

- McBlane, J.F. et al., 1995. Cleavage at a V(D)J recombination signal requires only RAG1 and RAG2 proteins and occurs in two steps. *Cell* 83:387-95.
- Akamatsu, Y. and M.A. Oettinger, 1998. Distinct roles of RAG1 and RAG2 in binding V(D)J recombination signal sequences. *Molecular Cell Biology* 18:4670-78.
- Kim, D.R. and M.A. Oettinger, 1998. Functional analysis of coordinated cleavage in V(D)J recombination. *Molecular Cell Biology* 18:4679-88.
- Kirch, S.A. et al., 1998. Dual role of RAG2 in V(D)J recombination: Catalysis and regulation of ordered Ig gene assembly. *EMBO Journal* 17:4884-86.
- Kwon, J. et al., (submitted). Accessibility of nucleosomal DNA to V(D)J recombination: RAG mediated cleavage of nucleosomal substrates is modulated by RSS positioning and HMG1.



## ABSTRACT

**Marjorie A. Oettinger** grew up in Boston, Massachusetts, the younger of two children. Her father was a professor at Harvard University; her mother taught biology at Harvard University; and her brother went to Harvard University as well. Her father's family was from Nürnberg; they left before World War II, lived in France for several years, and then came to America. Later, Oettinger visited Germany with her father, both finding it a distressing experience. She attended the Commonwealth School in Boston for her last two years of high school, though with her parents' influence on her interests, she was had difficulty deciding what she wanted to pursue as a career.

Oettinger entered Harvard thinking she would major in physics, but when she read Gunther S. Stent's *Molecular Genetics* she decided on biology. She worked in the Kevin Struhl lab as an undergraduate and decided to pursue both a Ph.D. and an M.D. Working under Struhl, she enjoyed the intellectual challenge and the camaraderie of lab work. While still an undergraduate, she trained high school students and undergraduates in the lab.

After working in Struhl's lab for a year Oettinger entered the Massachusetts Institute of Technology (MIT)'s graduate program in the health sciences and technology (HST). She attended a David Baltimore lecture on allelic exclusion and immediately decided to enter the Baltimore lab. There she collaborated with David G. Schatz on the recombination of V(D)J in fibroblasts. She discovered that RAG-1 and RAG-2 synergistically activate V(D)J recombination, explaining why she was predisposed to accept the idea that nonidentical genes with related functions could be located near each other.

Oettinger was uncertain about her future after graduate school. She finally decided not to pursue an M.D; instead she accepted a faculty position at Harvard. At this point in the interview, she reflected on the status and successes of her own lab; her collaboration with the Martin F. Gellert lab; collaboration and competition in science in general; differences between the David Baltimore lab and the Kevin Struhl lab; the importance of camaraderie in the lab; and funding.

She concludes the interview by discussing her dismay over the increasing tendency to fund clinical rather than basic research. She feels that her criteria for choosing research projects must now include factors like fundability and probability of publications rather than just interest or importance to her. For this reason she feels that private and interim grants like the Pew Scholars award are wonderful. While teaching in China for a month, she found that scientists there were chosen for political reasons rather as a matter of merit, but that they had a great deal of the newest and best equipment. The interview ends with Oettinger's insights on aspects of child-bearing and -rearing and her view of the need for further research on human infertility.

## UCLA INTERVIEW HISTORY

### INTERVIEWER:

Andrea R. Maestrejuan, Interviewer, UCLA Oral History Program; B.A., History, University of California, Irvine, 1988; B.S., Biological Sciences, University of California, Irvine, 1988; C.Phil., History, University of California, Riverside.

### TIME AND SETTING OF INTERVIEW:

**Place:** Oettinger's office, Massachusetts General Hospital, Boston.

**Dates, length of sessions:** February 10, 1997 (94 minutes); February 11, 1997 (111); February 12, 1997 (116).

**Total number of recorded hours:** 5.35

**Persons present during interview:** Oettinger and Maestrejuan.

### 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' 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 project consultants developed a topic outline. In preparing for this interview, Maestrejuan held a telephone pre interview conversation with Oettinger to obtain written background information (curriculum vitae, copies of published articles, etc.) and to agree on an interviewing schedule. She also reviewed prior Pew scholars' interviews and the documentation in Oettinger's file at the Pew Scholars Program office in San Francisco, including her proposal application, letters of recommendation, and reviews by Pew Scholars Program national advisory committee members.

For general background on the recent history of the biological sciences, Maestrejuan 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*. 3rd ed. New York: Garland, 1994.

The interview is organized chronologically, beginning with Oettinger's childhood in Boston and continuing through her graduate work at Massachusetts's Institute of Technology, her entry into the David Baltimore lab, and her faculty position at the Harvard University School of Medicine. Major topics discussed include her working relationship with David Baltimore, the discovery of RAG-2, and the obstacles facing women in science.

## ORIGINAL EDITING:

Gregory M.D. Beyrer, editorial assistant, edited the interview. He 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.

Oettinger reviewed the transcript. She verified proper names and made minor corrections and additions.

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

Jennifer Levine, editorial assistant, assembled the biographical summary.

Beyrer prepared the interview history.

Ödül Bozkurt, editorial assistant, compiled the index.

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