CHEMICAL HERITAGE FOUNDATION

BEVERLY M. EMERSON

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview
Conducted by

Neil D. Hathaway

at

Salk Institute for Biological Studies
La Jolla, California

on

16, 18, 21 December 1992 and 28 January 1993

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.

This oral history was completed under the auspices of the Oral History Project, University of California, Los Angeles (Copyright © 1993, The Regents of the University of California) and is made possible through the generosity of

From the original collection at the Center for Oral History Research, UCLA Library, UCLA.

The following oral history, originally processed at the UCLA Center for Oral History Research, has been reformatted by the Chemical Heritage Foundation. The process involved reformatting the front matter, adding a new abstract, replacing the table of contents, and replacing the index. The paragraph spacing and font of the body of the transcript were altered to conform to the standards of the Oral History Program at the Chemical Heritage Foundation. The text of the oral history remains unaltered; any inadvertent spelling or factual errors in the original manuscript have not been modified. The reformatted version and digital copies of the interview recordings are housed at the Othmer Library, Chemical Heritage Foundation. The original version and research materials remain at the Darling Library, University of California, Los Angeles and at the Bancroft Library, University of California, Berkeley.

REFORMATTING:

Hilary Domush, Program Assistant, Biomedical Sciences and Technologies, Chemical Heritage Foundation. B.S. Chemistry, Bates College, M.S. Chemistry, University of Wisconsin, M.A. History of Science, University of Wisconsin.

David J. Caruso, Program Manager, Biomedical Sciences and Technologies, Chemical Heritage Foundation. B.A., History of Science, Medicine, and Technology, Johns Hopkins University; PhD., Science and Technology Studies, Cornell University.

UNIVERSITY OF CALIFORNIA, LOS ANGELES

Oral History Interview Agreement No. R931203

This Interview Agreement is made and entered into this 30th day of November, 1993, by and between THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, a California corporation, on behalf of the Oral History Program at the UCLA campus, hereinafter called "University," and BEVERLY M. EMERSON, having an address at The Salk Institute for Biological Studies, P. O. Box 85800, San Diego, California 92186-5800, hereinafter called "Interviewee."

Interviewee agrees to participate in a series of University-conducted tape-recorded interviews, commencing on or about December 16, 1992, and tentatively entitled "Interview with Beverly M. Emerson." This Agreement relates to any and all materials originating from the interviews, namely the tape recordings of the interviews and a written manuscript prepared from the tapes, hereinafter collectively called "the Work."

In consideration of the mutual covenants, conditions and terms set forth below, the parties hereto hereby agree as follows:

1. Interviewee irrevocably assigns to University all her copyright, title and interest in and to the Work. This assignment applies to University, its successors, and assigns, for and during the existence of the copyright and all renewals and extensions thereof.

2. By virtue of this assignment, University will have the right to use the Work for any research and educational purpose that University deems appropriate.

3. University agrees to forward to Interviewee for written approval any requests received by University from any party for permission to quote from the Work, for the period of the Interviewee's lifetime. After such time, University will have the sole right to grant or refuse such requests.

4. Interviewee acknowledges that she will receive no remuneration or compensation for her participation in the interviews or for the rights assigned hereunder.

5. Interviewee will receive from University, free of charge, one bound copy of the typewritten manuscript of the interviews.

6. To insure against substantive error or misquotation, Interviewee will have the right to review the manuscript before it is put into final form and make any substantive comments that Interviewee deems appropriate. University therefore will send Interviewee a copy of the edited transcript for review and comment. Interviewee will return transcript and comments to University within 30 days of receipt of the transcript. University will then incorporate Interviewee's comments into the Work. In

the event that Interviewee does not respond within 30 days, University will assume that Interviewee has given full approval of the transcript.

7. All notices and other official correspondence concerning this Agreement will be sent to the following:

If to University: Office of Intellectual Property Administration
University of California, Los Angeles
405 Hilgard Avenue
Los Angeles, California 90024-1406

Attention: Ms. Carli V. Rogers
Copyright Officer

If to Interviewee: Beverly M. Emerson, Ph.D.
The Salk Institute for Biological Studies
P. O. Box 85800
San Diego, California 92186-5800

University and Interviewee have executed this Agreement on the date first written above.

INTERVIEWEE

Beverly M. Emerson

(Signature)

Beverly M. Emerson
The Salk Institute for Biological Studies
P. O. Box 85800
San Diego, California 92186-5800

Date November 30, 1993

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

Carli V. Rogers

(Signature)

Carli V. Rogers
Copyright Officer

Date December 7, 1993

3CR1027C

Pew Scholars in the Biomedical Sciences

Chemical Heritage Foundation Internet Posting Release Form

I, Beverly M. Emerson, Ph.D., hereby grant permission to post portions of the digital copy of the audio-taped interview of me, and the related written transcript, on the internet for non-commercial, educational use only as per the checked selection below.

Please check one:

a. _____ **No restrictions for Internet Posting.**
NOTE: Users citing this interview for purposes of publication are obliged under the terms of the Chemical Heritage Foundation Oral History Program to obtain permission from Chemical Heritage Foundation, Philadelphia, Pennsylvania.

b. ✓ **Semi-restricted Internet Postings** (My review of the material intended to post is required.)

c. _____ **Restricted access.** (Do not post.)

This constitutes my entire and complete understanding.

Beverly M. Emerson

Beverly M. Emerson, Ph.D.

Dec 17, 2007

Date

This interview has been designated as **Semi-Restricted Access**

One may view the oral history with the permission of CHF.
However, the permission of the interviewee is required to quote from, cite, or reproduce the oral history.

Please contact CHF to request permission.

Chemical Heritage Foundation
Oral History Program
315 Chestnut Street
Philadelphia, Pennsylvania 19106

The Chemical Heritage Foundation (CHF) serves the community of the chemical and molecular sciences, and the wider public, by treasuring the past, educating the present, and inspiring the future. CHF maintains a world-class collection of materials that document the history and heritage of the chemical and molecular sciences, technologies, and industries; encourages research in CHF collections; and carries out a program of outreach and interpretation in order to advance an understanding of the role of the chemical and molecular sciences, technologies, and industries in shaping society.

BEVERLY M. EMERSON

1952	Born in Eugene, Oregon on 18 January

Education

1975	B.A., Biology, University of California, San Diego
1981	Ph.D., Molecular Biology, Washington University School of Medicine

Professional Experience

National Institute of Arthritis, Diabetes, and Digestive and Kidney Disease

1981-1986 Staff Fellow, Section on Physical Chemistry, Laboratory of Molecular Biology

Salk Institute for Biological Studies

1986-present Associate Professor, Regulatory Biology Laboratory

Honors

1972-1973	University of California Education Abroad Program award to study in Great Britain
1981-1986	National Institutes of Health Staff fellowship
1988-1992	Pew Scholars Award in the Biomedical Sciences

Selected Publications

Emerson, B.M. and R.G. Roeder, 1984. Isolation and genomic arrangement of active and inactive forms of mammalian 5SRNA genes. *Journal of Biological Chemistry,* 259:7916-25.

Emerson, B.M. and R.G. Roeder, 1984. DNA sequences and transcription factor interactions of active and inactive forms of mammalian 5SRNA genes. *Journal of Biological Chemistry,* 259:7926-35.

Emerson, B.M. and G. Felsenfeld, 1984. Specific factor conferring nuclease hypersensitivity at the 5′ end of the chicken adult β-globin gene. *Proceedings of the National Academy of Sciences USA,* 81:95-99.

Emerson, B.M. et al., 1985. Interaction of specific nuclear factors with the nuclease hypersensitive region of the chicken adult β-globin gene: Nature of the binding domain.

Cell, 41:21-30.

Emerson, B.M. et al., 1987. Analysis of the tissue-specific enhancer at the 3′ end of the chicken adult β-globin gene. *Proceedings of the National Academy of Sciences USA*, 84:4786-90.

Emerson, B.M. et al., 1989. Erythroid-specific activation and depression of the chicken β-globin promoter *in vitro. Cell*, 57:1189-1200.

Fong, T.C. and B.M. Emerson, 1992. The erythroid-specific protein cGATA-1 mediates distal enhancer activity through a specialized β-globin TATA box. *Genes and Development*, 6:521-32.

Emerson, B.M., "Gene Expression in Hematopoietic Cells: The β-globin Gene." In *Gene Expression: General and Cell-Type Specific*, ed. Michael Karin (Boston: Birkhauser Press, 1993), pp. 116-61.

ABSTRACT

Beverly M. Emerson was born in Eugene, Oregon, and spent much of her childhood there. She was the only child of her two parents, but her father had three children by a previous marriage. Her parents divorced when she was young, and her mother began travelling, settling in San Francisco for a month or two at a time and then returning to Eugene. Beverly missed a great deal of school, but she educated herself by reading. Although she herself had not finished high school, Beverly's mother emphasized to Beverly the importance of college education, and insisted that the University of Oregon was not good enough for Beverly. Somehow able to support them both, Beverly's mother sent Beverly to La Châtelainie Institute in Neuchâtel, Switzerland, for a year. Beverly's early school experiences did not instill academic diligence, and Beverly's grades were only average.

Fortunately, her test scores were good, and she matriculated into the University of California, San Diego, where at last she discovered a love of learning, especially in science. During college Beverly spent a year studying at St. Andrews in Scotland, and when she came back her academic ambitions were well established. She worked in Donald Helinski's and Peter Geiduschek's labs; the latter became her mentor and template for a scientist, and she continues to have a professional relationship with him still. She admired him so much that when she graduated she spent a year working as a technician in Geiduschek's lab.

Deciding to attend graduate school at Washington University in St. Louis, Beverly began working in Robert Roeder's lab. Her project caused her some difficulties she could not solve until a guest speaker, Shirley Tilghman, pointed out something to her. When she finished her PhD, she decided to accept a postdoc in Gary Felsenfeld's lab at the National Institutes of Health; there she began the transcription research that she has continued ever since. Although she began her current work in Felsenfeld's lab, that work has branched off from his area; she is concentrating on β-globin and chromatin. Beverly has her own lab now at the Salk Institute for Biological Sciences. She foresees herself continuing this same work until the end of her career, quite possibly at the Salk.

In addition to explaining her work, Beverly discussed protein purification, gene cloning, gene transcription, transcription factors, TATA boxes, chromatin structure, the construction of an *in vitro* transcription system, the locus control region, the Salk Institute, her Frog Room, and the status of women in scientific research.

UCLA INTERVIEW HISTORY

INTERVIEWER:

Neil D. Hathaway, Interviewer, UCLA Oral History Program. B.A., English and History, Georgetown University; M.A. and C.Phil., History, UCLA.

TIME AND SETTING OF INTERVIEW:

Place: Salk Institute for Biological Studies, La Jolla, California.

Dates, length of sessions: December 16, 1992 (82 minutes); December 18, 1992 (80); December 21, 1992 (84); January 28, 1993 (201).

Total number of recorded hours: 7.5

Persons present during interview: Emerson and Hathaway.

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 five-year Pew scholarships, from 1988 through 1992.

In preparing for this interview, Hathaway, in consultation with the director of the UCLA Oral History Program and three UCLA faculty project consultants, developed a topic outline to provide an overall interview framework. Hathaway then held an in-person preinterview conversation with Emerson to obtain extensive written background information (curriculum vitae, copies of published articles, etc.) and agree on a research and interviewing timetable. Hathaway further reviewed the documentation in Emerson's file at the Pew Scholars Program office in San Francisco, including her proposal application, letters of recommendation, and reviews by Pew Scholars Program board members.

In addition to reading all of Emerson's published works, Hathaway surveyed recent articles on gene transcription in the scientific literature. For general background on the recent history of the biological sciences, Hathaway consulted such works as J.D. Watson et al., *The Molecular Biology of the Gene.* 4th ed. 2 vols. Menlo Park, CA: Benjamin/Cummings, 1987; Lubert Stryer, *Biochemistry,* 3d ed. New York: W.H. Freeman, 1988; *Journal of the History of Biology;* and H.F. Judson, *The Eighth Day of Creation: Makers of the Revolution in Biology.* New York: Simon and Schuster, 1979.

The interview is organized chronologically, beginning with Emerson's childhood in Eugene, Oregon, and her undergraduate education at University of California, San Diego, and continuing through her graduate education at Washington University School of Medicine, her years as a staff fellow at the National Institutes of Health, and the creation of her own lab at the Salk Institute for Biological Studies. Major topics discussed include protein purification gene

cloning, gene transcription, transcription factors, TATA boxes, chromatin structure, the construction of an in vitro transcription system, the locus control region, the Salk Institute, and the status of women in scientific research.

ORIGINAL EDITING:

Steven J. Novak, editor, 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.

Emerson reviewed the transcript. She verified proper names and made a number of corrections and additions.

Novak also prepared the table of contents, biographical summary, interview history, and index.

TABLE OF CONTENTS

INDEX

N

O

P

R

S

Z

β