CHEMICAL HERITAGE FOUNDATION

SARAH A. WOODSON

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview
Conducted by

Helene L. Cohen

at

Johns Hopkins University
Baltimore, Maryland

on

19-21 July 1999

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 the Pew Scholars Program in the Biomedical Sciences Advisory Committee members.

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:

Marnie Berkowitz, Consultant to the Chemical Heritage Foundation. B.A., Classical Languages and Literatures, University of Minnesota; Ford Foundation Fellowship, Classical Languages and Literatures, University of Chicago.

David J. Caruso, Program Manager, Oral History, 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. T0805998

This Interview Agreement is made and entered into this 5th day of August, 1999 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 SARAH A. WOODSON, having an address at Department of Biophysics, Johns Hopkins University, 3400 North Charles Street, Baltimore, Maryland 21218-2685, hereinafter called "Interviewee."

Interviewee agrees to participate in a series of University-conducted tape-recorded interviews, commencing on or about July 19, 1999, and tentatively entitled "Interview with Sarah A. Woodson". 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, educational, or other purpose, including electronic reproduction, that University may deem appropriate.

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

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

5. To insure against substantive error or misquotation, Interviewee will have the right to review the manuscript before it is put into final form. 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. In the event that Interviewee does not respond within 30 days, University will assume that Interviewee has given full approval of the transcript.

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

If to University: Oral History Program
University of California, Los Angeles
Box 951575
Los Angeles, California 90095-1575

Attention: Director

If to Interviewee: Sarah A. Woodson
Department of Biophysics
Johns Hopkins University
3400 North Charles Street
Baltimore, Maryland 21218-2685

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

INTERVIEWEE

Sarah A Woodson
(Signature)

Sarah A. Woodson
(Typed Name)

Department of Biophysics

Johns Hopkins University
(Address)

Baltimore, MD 21218-2685

Date 7/19/99

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

Dale E. Treleven
(Signature)

Dale E. Treleven
(Typed Name)

Director, Oral History Program
(Title)

Date August 5, 1999

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

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SARAH A. WOODSON

1961 Born in Warren, Michigan on 7 October

Education

1982 B.A., Kalamazoo College
1987 Ph.D., Yale University

Professional Experience

University of Colorado
1998-1990 Postdoctoral Fellow

University of Maryland
1990-1996 Assistant Professor
1996-1999 Associate Professor

Johns Hopkins University
1999-present Professor

Honors

1998-1990 American Cancer Society Postdoctoral Fellow
1993-1995 American Cancer Society Junior Faculty Research Award
1993-1997 Pew Scholar in the Biomedical Sciences

Selected Publications

Thirumalai, D. and S.A. Woodson, 1996. Kinetics of folding of proteins and RNA. Accounts of Chemical Research 29: 433-39.

Emerick, V. L. et al., 1996. Analysis of rate-determining conformational changes during splicing of the *Tetrahymena* intron. Biochemistry 35:13469-477.

Nikolcheva, T. and S.A. Woodson, 1997. Association of a group I intron with its splice junction in 50S ribosomes: implications for intron toxicity. Journal of Molecular Biology 3:1016-27.

Pan, J. et al., 1997. Folding of RNA involves parallel pathways. Journal of Molecular Biology 273:7-13.

Roman, J. and S.A. Woodson, 1998. Integration of the *Tetrahymena* IVS into bacterial rRNA

by reverse splicing in vivo. Proceedings of the National Academy of Science, USA 95:2134-39.
Sclavi, B. et al, 1998. Visualizing RNA folding at millisecond intervals with x-ray footprinting. Science 279:1940-43.
Pan, J. and S.A. Woodson, 1998. Folding intermediates of a self-splicing RNA: mispairing of the catalytic core. Journal of Molecular Biology 280:597-609.
Cao, Y. and S.A. Woodson, 1998. Destabilizing effect of an rRNA stem-loop on an attenuator hairpin in the 5' exon of the *Tetrahymena* pre-rRNA. Journal of Molecular Biology 4:901-14.

ABSTRACT

Sarah A. Woodson was born and raised in Warren, Michigan. Her father was a music teacher; Sarah's mother, who was from Amsterdam, Holland, was a housewife until her children were older, when she finished college and became a teacher. Sarah began as a violinist and soon switched to piano. She was always interested in science, beginning in second grade with the solar system. She believes that she was shy, and she took refuge in books, reading a great deal of the time. Her father believed that women had a certain subservient place in society and should follow certain codes of behavior, codes that did not permit married women to work.

But Sarah's mother helped Sarah rebel against the strictures and go into science in college. She attended Kalamazoo College, majoring in chemistry and being graduated Phi Beta Kappa. After spending a year at a lab in France, she had to do a research project, which she did in Morton Rabin's lab at Wayne State University.

From Michigan Woodson went to Yale University, where she worked in Donald M. Crothers' lab, studying nucleic acids using NMR (nuclear magnetic resonance spectroscopy). After five years there she spent three years as a postdoc with Thomas Cech at University of Colorado. There she studied RNA, discovering reverse self-splicing. While there she met her future husband, Steven Rokita.

She then accepted a position at the University of Maryland, and she and Rokita, who was on the chemistry faculty at State University of New York at Stony Brook, began their relationship. While at Maryland Sarah developed a revised biochemistry program for undergraduates. She moved from assistant to associate professor, when she was granted tenure; then she obtained full professorship. At that point she was offered a position at Johns Hopkins University, where she continues to teach, run her lab, publish, write grant proposals, and attempt to mentor her lab members. Her work on the structures and interactions of RNA continues. Her husband, Steven Rokita, is now a faculty member in the departments of chemistry and biochemistry at the University of Maryland.

UCLA INTERVIEW HISTORY

INTERVIEWER:

Helene L. Cohen, Interviewer, UCLA Oral History Program. B.S., Nursing, UCLA; P.N.P., University of California, San Diego/UCLA; M.A., Theater, San Diego State University.

TIME AND SETTING OF INTERVIEW:

Place: Woodson's office, Johns Hopkins University.

Dates, length of sessions: July 19, 1999 (94 minutes); July 20, 1999 (103); July 21, 1999 (102).

Total number of recorded hours: 5

Persons present during interview: Woodson and Cohen.

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 project consultants developed a topic outline. In preparing for this interview, Cohen held a telephone preinterview conversation with Woodson to obtain written background information (curriculum vitae, copies of published articles, etc.) and agree on an interviewing schedule. She also reviewed prior Pew scholars' interviews and the documentation in Woodson'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 technical background, Cohen consulted J.D. Watson et al., Molecular Biology of the Gene. 4th ed. Menlo Park, California: Benjamin/Cummings, 1987; Bruce Alberts et al., Molecular Biology of the Cell. 3rd ed. New York: Garland, 1994; Horace F. Judson, The Eighth Day of Creation. New York: Simon and Schuster, 1979; and recent issues of Science and Nature.

The interview is organized chronologically, beginning with Woodson's childhood in Warren, Michigan, and continuing through her undergraduate work at Kalamazoo College, her graduate work at Yale University, her postdoc at University of Colorado, and the establishment of her own labs at University of Maryland and Johns Hopkins University. Major topics discussed include her religious background, her research on reverse self-splicing, her research on RNA structure, and gender issues in science.

ORIGINAL EDITING:

Ji Young Kwon, 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.

Woodson did not review the transcript and therefore some names have not been verified.

William Van Benschoten, editor, prepared the table of contents. Kwon assembled the biographical summary and interview history. Victoria Simmons, editorial assistant, compiled the index.

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