CHEMICAL HERITAGE FOUNDATION

LEE ANN NISWANDER

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview
Conducted by

Helene L. Cohen

at

Memorial Sloan-Kettering Cancer Center
New York City, New York

on

15, 17-18 May 2000

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.

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. T0602000

This Interview Agreement is made and entered into this 2nd day of June, 2000 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 LEE ANN NISWANDER, having an address at Department of Molecular Biology, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, Box 73, New York, New York 10021, hereinafter called "Interviewee."

Interviewee agrees to participate in a series of University-conducted tape-recorded interviews, commencing on or about May 15, 2000, and tentatively entitled "Interview with Lee Ann Niswander". 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: Lee Ann Niswander
Department of Molecular Biology
Memorial Sloan-Kettering Cancer Center
1275 York Avenue, Box 73
New York, New York 10021

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

INTERVIEWEE

X Lee Ann Niswander
(Signature)

Lee Ann Niswander
(Typed Name)

Memorial Sloan-Kettering Cancer Center
(Address)

1275 York Avenue, Box 73

New York, New York 10021

X Date May 15, 2000

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

Dale E. Treleven
(Signature)

Dale E. Treleven
(Typed Name)

Director, Oral History Program
(Title)

Date June 2, 2000

Pew Scholars in the Biomedical Sciences

Chemical Heritage Foundation Internet Posting Release Form

I, Lee Ann Niswander, Ph.D., hereby request that my wishes be followed as per the checked selection below with regards to posting 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.

Please check one:

a. X **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.

Lee Ann Niswander

Lee Ann Niswander, Ph.D.

Feb 14, 2008

Date

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

LEE ANN NISWANDER

1957	Born in Bluffton, Ohio on 27 June

Education

1980	B.A., University of Colorado, Boulder
1985	M.S., University of Colorado Health Sciences Center
1990	Ph.D., Case Western Reserve University

Professional Experience

University of Colorado Health Sciences Center

1980-1984	Research Assistant

University of California, San Francisco

1990-1993	Postdoctoral Fellow

Memorial Sloan-Kettering Cancer Center, Molecular Biology Program

1993-1998	Assistant Member
1998-present	Associate Member

Honors

1991-1993	American Cancer Society Postdoctoral Fellowship
1995-1999	Pew Scholar in the Biomedical Sciences
1997-present	Howard Hughes Medical Institute, Assistant Investigator

Selected Publications

Niswander, L. et al., 1989. The albino-deletion complex in the mouse defines genes necessary for development of embryonic and extraembryonic ectoderm. *Development* 105:175-82.

Niswander, L. and G.R. Miller, 1993. FGF-4 and BMP-2 have opposite effects on limb growth. *Nature* 361:68-71.

Niswander, L. et al., 1993. FGF-4 replaces the apical ectodermal ridge and directs outgrowth and patterning of the limb. *Cell* 75:579-87.

Niswander, L. et al., 1994. Positive feedback loop coordinates growth and patterning in the vertebrate limb. *Nature* 371:609-12.

Yang, Y. and L. Niswander, 1995. Interaction between the signaling molecules WNT and

SHH during vertebrate limb development: dorsal signals regulate anteroposterior patterning. *Cell* 80:939-47.
Zou, H. and L. Niswander, 1996. Requirement for BMP signaling in interdigital apoptosis and scale formation. *Science* 272:738-41.
Kuhlman, J. and L. Niswander, 1997. Limb deformity protein: Role in mesodermal induction of the apical ectodermal ridge. *Development* 124: 133-39.
Zou, H. et al., 1997. Distinct roles of type I bone morphogenetic protein receptors in the formation of different cartilage. *Genes and Development* 11:2191-203.
Pizette, S. and L. Niswander, 1999. BMPs negatively regulate structure and function of the limb apical ectodermal ridge. *Development* 126:883-94.
Pizette, S. et al., 2001. BMP controls proximodistal outgrowth, via induction of the apical ectodermal ridge, and dorsoventral patterning in the vertebrate limb. *Development* 128:4463-74.

ABSTRACT

Lee Ann Niswander was born in Bluffton, Ohio, the fourth child of six. Her parents were moderately devout Mennonites until her father's job caused them to move to Okemos, Michigan, where they became Methodists. Both parents were musical and they taught their children to be musical as well (the family won an award in a national musical contest). Lee Ann loved school, especially mathematics and science, in both of which she did well. When she was in high school she worked with disabled people, and she began Western Michigan University intending to major in special education. Finding that boring she moved to Colorado, where she worked on dude ranches for a few years before matriculating at the University of Colorado. She wanted to take her degree in chemistry, but she discovered that she enjoyed her biology classes as well.

Still not sure that she wanted to go to medical school, but not knowing what else she could do, she finished college and applied to the Peace Corps. Although she was accepted and assigned to Lesotho, she decided not to go. Instead she worked as a technician at the University of Colorado Health Sciences Center for four years before deciding to go back to school. During these four years she also obtained a Master's degree and met her future husband, Richard Davis. When Davis decided to accept a postdoc at Case Western Reserve University, Lee Ann applied to and was accepted into a PhD program in developmental biology at Case Western. There she worked in two *Drosophila* labs, one with Anthony Mahowald; then she went to Terry Magnuson's lab to work on mouse genetics. She also spent three months in Sweden, learning microdissection and microcloning; she was working on a phenotype that arises from a deletion of a part of mouse chromosome 7 and that has an early embryonic phenotype during gastrulation. When she finished her PhD she and Davis married and went to the University of California at San Francisco, where Lee Ann had a postdoc in Gail Martin's lab. There her project involved FGF-4.

From California Niswander and her husband moved to New York City, where she accepted an assistant member position at Memorial Sloan-Kettering Cancer Center. In addition to the Pew grant she has also won a Howard Hughes Medical Institute award and has been promoted to associate member at Sloan-Kettering. As a PI, she has three major projects in her lab: limb development in the chick embryo; neural tube patterning, or why there are different types of neurons along the dorsal-ventral axis in the neural tube; and feather bud development. She also is co-director and a teacher of a developmental biology course the cell biology course at the Weill Medical College of Cornell University. In summers she co-teaches a section of a course in embryology with John Saunders at Woods Hole Oceanographic Institute.

Lee Ann continues to publish, to teach, to experiment, to seek funding, and to attempt to balance all this with her family life.

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: Niswander's Office, Memorial Sloan-Kettering Cancer Center.

Dates, length of sessions: May 15, 2000 (96 minutes); May 17, 2000 (100); May 18, 2000 (90).

Total number of recorded hours: 4.8

Persons present during interview: Niswander 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' 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 Niswander 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 Niswander'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 Niswander's childhood in Okemos, Michigan, and continuing through her undergraduate work at University of Colorado, Boulder, her graduate work at University of Colorado Health Sciences Center and Case Western Reserve University, her postdoc at University of California, San Francisco, and the establishment of her own lab at Memorial Sloan-Kettering Cancer Center. Major topics discussed include her Mennonite family background, her research on fibroblast growth factor family members in the Gail R. Martin laboratory, and the scope of her present work at Memorial Sloan-Kettering Cancer Center.

ORIGINAL EDITING:

Gail Ostergren, 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.

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

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

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