CHEMICAL HERITAGE FOUNDATION

MARK P. KAMPS

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview
Conducted by

Andrea R. Maestrejuan

at

University of California, San Diego
San Diego, California

on

10, 11, and 12 February 1998

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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REFORMATTING:

Holly Polish, Program Intern, Oral History, Chemical Heritage Foundation. B.A. History, American University.

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. 980218

This Interview Agreement is made and entered into this Second 26th day of February May 1998 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 MARK P. KAMPS, having an address at Department of Pathology, 0612, University of Califiornia, San Diego, 9500 Gilman Drive, La Jolla, California 92093-0612, hereinafter called "Interviewee."

Interviewee agrees to participate in a series of University-conducted tape-recorded interviews, commencing on or about February 10, 1998, and tentatively entitled "Interview with Mark P. Kamps". 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 his 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 he will receive no remuneration or compensation for his 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: Office of Research Administration
University of California, Los Angeles
P.O. Box 951406
Los Angeles, California 90095-1406

Attention: Ms. Carli V. Rogers
Copyright Officer

If to Interviewee: Mark P. Kamps
University of California, San Diego
Department of Pathology, 0612
9500 Gilman Drive
La Jolla, California 92093-0612

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

INTERVIEWEE

Mark P. Kamps
(Signature)

Mark P. Kamps
(Typed Name)

University of California
San Diego

Department of Pathology
(Address)

La Jolla, CA 92093-0612

Date 2/10/98

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

(Signature)

for Carli V. Rogers
(Typed Name)

Copyright Officer
(Title)

Date 6/26/98

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

MARK P. KAMPS

1959 Born in Detroit, Michigan, on 6 September

Education

1981 B.S., Chemistry and Biology, Calvin College
1987 Ph.D., Biochemistry, University of California, San Diego

Professional Experience

Salk Institute in the Biological Sciences, La Jolla, California
1987-1988 Postdoctoral Fellow

Whitehead Institute for Biomedical Research, Massachusetts Institute of Technology, Cambridge, Massachusetts
1988-1991 Postdoctoral Fellow

University of California, San Diego, San Diego, California
1991-1997 Assistant Professor, Department of Pathology
1997-present Associate Professor, Department of Pathology

Honors

1988-1991 Damon Runyon-Walter Winchell Cancer Research Fellow
1992-1996 Pew Scholar in the Biomedical Sciences
1997-present Leukemia Society Scholar

Selected Publications

Kamps, M.P. et al., 1984. Direct evidence that oncogenic tyrosine kinases and cyclic AMP-dependent protein kinase have found homologous ATP-binding sites. *Nature* 310:589-91.

Kamps, M.P. et al., 1986. Rous sarcoma virus transforming protein lacking myristic acid phophorylates known polypeptide substrates without inducing transformation. *Cell* 45:105-12.

Kamps, M.P. et al., 1990. A new homeobox gene contributes the DNA binding domain of the t (1; 19) translocation protein pre-B ALL. *Cell* 60:547-55.

Kamps, M.P. et al., 1990. The promoter of the human interleukin-2 gene contains two octamer-binding sites and is partially activated by the expression of Oct-2. *Molecular and Cellular Biology* 10:5464-72.

Kamps, M.P. et al., 1991. The human t(1;19) translocation in pre-B ALL produces multiple nuclear E2a-Pbx1 fusion proteins with differing transforming potentials. *Genes and Development* 5:353-68.

Kamps, M.P. et al., 1993. E2a-Pbx1, the t(1;19) translocation protein of human pre-B cell acute lymphocytic leukemia, causes acute myeloid leukemia in mice. *Molecular and Cellular Biology* 13:351-57.

Lu, Q. et al., 1994. Fusion with E2a converts the Pbx1 homeodomain protein into a constitutive transcriptional activator in human leukemias carrying the t(1;19) translocation. *Molecular and Cellular Biology* 14:3938-48.

Kamps, M.P. et al., 1994. Oncoprotein E2a-Pbx1 immortalizes a primary myeloid progenitor without abrogating its factor-dependence. *Oncogene* 9:3159-66.

Lu, Q. et al., 1995. Both Pbx1 and E2a-Pbx1 bind DNA cooperatively with the products of multiple murine Hox genes, some of which are themselves oncogenes. *Molecular and Cellular Biology* 15:3786-95.

Knoepfler, P. et al., 1995. The pentapeptide motif of Hox proteins is required for cooperative DNA binding with Pbx1, physically contacts Pbx1, and enhances DNA-binding by Pbx1. *Molecular and Cellular Biology* 15:5811-19.

Kamps, M.P. et al., 1996. DNA-binding by oncoprotein E2a-Pbx1 is important for blocking differentiation but dispensable for fibroblast transformation. *Oncogene* 12:19-30.

Lu, Q. et al., 1996. Structural determinants within Pbx1 that mediate cooperative DNA binding with pentapeptide-containing Hox proteins--Proposal for a model of the Pbx1-Hox-DNA complex. *Molecular and Cellular Biology* 16:1632-40.

Fu, X. et al., 1997. E2a-Pbx1 induces transcription of tissue-specific and developmentally regulated genes in NIH3T3 fibroblasts. *Molecular and Cellular Biology* 17:1503-12.

Knoepfler, P. et al., 1997. Meis1 and pKnox1 bind DNA cooperatively with Pbx1 utilizing an interaction surface disrupted in oncoprotein E2a-Pbx1. *Proceedings of the National Academy of Sciences USA* 94:14553-58.

ABSTRACT

Mark P. Kamps grew up in northern New Jersey, one of four children. His father was an engineer, his mother a teacher until her children came along. Kamps's parents, of Dutch descent, belonged to the Christian Reformed Church, and religion infused the family's lives. Kamps feels that his life is now somewhat less rigidly structured than his parents' lives were, but his religion is still very important to him, his wife, and their daughter. He explains how science and religion can coexist peacefully, in his opinion, and the impact of Christian values on his own research.

All four children were expected to go to Calvin College, and all did. Kamps's sisters ended up working with computers before becoming homemakers, and he attempts to explain how that happened. He says he always had a natural aptitude for math and the sciences and an unsentimental interest in animals and nature and how they work. Liking both chemistry and biology, he had a double major; he decided to pursue an academic career in biochemistry. He found the quality of education at Calvin College outstanding. Two professors, Felix Rottman from Michigan State University, and Robert Albers influenced his choice of graduate school.

Kamps began his graduate career at University of California, San Diego (UCSD). There he became interested in Bartholomew Sefton's work in avian retroviruses. He had always been fascinated by human disease, especially by how cancer develops. After rotations through the labs of Russell Doolittle, Bartholomew Sefton, and Jack Kyte, he entered the Sefton lab, where he identified the ATP-binding site of *SRC* and discovered that oncogenic tyrosine kinases and cyclic AMP-dependent protein kinase have homologous ATP-binding sites. He published in *Nature*. Here Kamps talks about his love of bench work; his relationship with Sefton; the need for graduate students to learn how to design experiments and do long-term planning; about identifying targets for $p60^{SRC}$ kinase activity; about his collaboration with John Glenney; and about ethics in science.

Kamps accepted a postdoc in David Baltimore's lab at Massachusetts Institute of Technology, where he worked on transcription factors. He describes Baltimore's lab and its method of operation. He talks about the cloning and sequencing of the first chimeric transcription factor gene, *E2A*; about identifying oncogenes and their function; about factors that contributed to Kamps's discovery of *E2A-Pbx1;* and about how the discovery of a new gene furthered Kamps's scientific career.

Next Kamps accepted a position at UCSD. He describes his startup package and subsequent funding. He delves into how he remains competitive in a competitive research environment, as well as into the advantages and disadvantages of scientific competition. He treats his graduate students well and tries to impress upon them the importance of scientific pedigree in gaining a position in academia. He talks about his plans for future research involving *E2A-Pbx1* and the relevance of biological model systems in understanding human disease. Kamps reasserts his fascination with learning the mechanisms of carcinogenesis.

Kamps prefers basic research to clinical and believes that it is important to have a diversity of projects in a lab. He talks about funding in general at UCSD and about his own funding, specifically the Pew Scholars Program in the Biomedical Science scholarship; the elements of an ideal research environment; gender issues in science; working with students in the lab; and the importance of advancing science literacy. He concludes his interview by explaining how he attempts to balance family life with life in the lab.

UCLA INTERVIEW HISTORY

INTERVIEWER:

Andrea R. Maestrejuan, Interviewer, UCLA Oral History Program; B.S., Biological Sciences, University of California, Irvine, 1986; M.A., History, University of California, Riverside, 1991; C.Phil., History, University of California, Riverside.

TIME AND SETTING OF INTERVIEW:

Place: Kamps's office, University of California, San Diego

Dates, length of sessions: February 10, 1998 (133 minutes); February 11, 1998 (175) ; February 12, 1998 (126).

Total number of recorded hours: 7

Persons present during interview: Kamps 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'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, Maestrejuan held a telephone preinterview conversation with Kamps 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 Kamps'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, Maestrejuan consulted J.D. Watson et al., *Molecular Biology of the Gene.* 4th ed. Menlo Park, CA: Benjamin/Cummings, 1987; Bruce Alberts et al., *Molecular Biology of the Cell.* 3rd ed. New York: Garland, 1994.

The interview is organized chronologically, beginning with Kamps's childhood in Detroit, Michigan, and continuing through his undergraduate work at Calvin College, his graduate work at University of California, San Diego (UCSD), his postdocs at the Salk Institute for Biological Studies and the Whitehead Institute for Biomedical Research, and the establishment of his own lab at UCSD. Major topics discussed include the impact of the Christian Reformed Church on Kamps, the quality of his education at Calvin College, the cloning and sequencing of the first chimeric transcription factor gene, the quality of his education at Calvin College, and the importance of having project diversity in the lab.

ORIGINAL EDITING:

William Van Benschoten, 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.

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

Van Benschoten also prepared the table of contents, biographical summary, and interview history.

Susan Croteau, editorial assistant, compiled the index.

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