CHEMICAL HERITAGE FOUNDATION

PAUL J. ANDERSON

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview
Conducted by

Steven J. Novak

at

Dana-Farber Cancer Institute
Boston, MA

on

18, 19, and 22 May 1995

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 for Ph.D. work, Classical Languages and Literatures, University of Chicago.

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. R950601

This Interview Agreement is made and entered into this 16th day of June, 1995 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 PAUL J. ANDERSON having an address at Brigham and Women's Hospital, Department of Rheumatology and Immunology, 75 Francis Street, Boston, Massachusetts, 02115, hereinafter called "Interviewee."

Interviewee agrees to participate in a series of University-conducted tape-recorded interviews, commencing on or about May 18, 1995, and tentatively entitled "Interview with Paul J. Anderson". 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 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:

Paul J. Anderson
Brigham & Women's Hospital
Department of Rheumatology & Immunology
75 Francis Street
Boston, MA 02115

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

INTERVIEWEE

x _____
(Signature)

Paul J. Anderson
(Typed Name)

Brigham and Women's Hospital

75 Francis Street
(Address)

Boston, MA 02115

x Date 5/18/95

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

_____
(Signature)

Carli V. Rogers
(Typed Name)

Copyright Officer
(Title)

(Address)

Date June 16, 1995

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

PAUL J. ANDERSON

1956 Born in Syracuse, New York on 25 November

Education

1978 B.S, Biology, State University of New York at Stony Brook
1983 Ph.D., Biochemistry, New York University
1984 M.D., New York University

Professional Experience

Brigham and Women's Hospital, Boston
1984-1985 Intern
1985-1986 Resident

Brigham and Women's Hospital and Dana-Farber Cancer Institute
1986-1990 Clinical and Research Fellow

Harvard University Medical School, Boston
1988-1990 Instructor
1990-1994 Assistant Professor
1994-present Associate Professor

Honors

1978 Phi Beta Kappa
1978 Medical Scientist Training Program Fellowship
1980 Woods Hole Marine Biological Laboratory Prize
1981 New York Arthritis Foundation Summer Fellowship
1984 Alpha Omega Alpha
1987 Loeb Award, Arthritis Foundation
1990-1994 Pew Scholar in the Biomedical Sciences
1990 Cancer Research Institute Investigator Award
1994 Distinguished Alumnus Award, State University of New York at Stony Brook
1995 Leukemia Scholar Award

Selected Publications

Anderson, P. and W. Bauer, 1978. Supercoiling in closed circular DNA: Dependence upon ion type and concentration. *Biochemistry*, 17:594-601.

Anderson, P. et al., 1981. Entrapment of human leukocyte interferon in the aqueous interstices of liposomes. *Infection and Immunity*, 31:1099-1103.

Anderson, P. et al., 1982. Effect of primary amines on interferon action. *Virology*, 117:510-15.

Anderson, P. et al., 1982. Specific binding of ^{125}I-human interferon-gamma to high affinity receptors on human fibroblasts. *Journal of Biological Chemistry*, 257:11301-4.

Anderson, P. and J. Vilek, 1982. Synthesis and biological characterization of a covalent conjugate between interferon and ricin toxin B chain. *Virology*, 123:457-60.

Anderson, P. et al., 1983. Human interferon-gamma is internalized and degraded by cultured fibroblasts. *Journal of Biological Chemistry*, 258:6497-502.

Anderson, P. and C. Nagler, 1984. Photoaffinity labeling of interferon-gamma receptor on the surface of cultured fibroblasts. *Biochemical and Biophysical Research Communications*, 120:828-33.

Anderson, P. et al., 1987. Crosslinking T3 (CD3) with T4 (CD4) enhances the proliferation of resting T lymphocytes. *Journal of Immunology*, 139:678-82.

Anderson, P. et al., 1988. Comodulation of CD3 and CD4: Evidence for a specific association between CD4 and approximately 5% of the CD3: T cell receptor complexes on helper T lymphocytes. *Journal of Immunology*, 140:1732-37.

Anderson, P. et al., 1988. Crosslinking CD3 with CD2 using cepharose immobilized antibodies enhances T lymphocyte proliferation. *Cellular Immunology*, 115:246-56.

Anderson, P. et al., 1989. Monoclonal antibodies reactive with the T cell receptor ζ chain: Production and characterization using a new method. *Journal of Immunology*, 143:1899- 1904.

Anderson, P. et al., 1989. CD3-negative natural killer cells express TCR ζ as part of a novel molecular complex. *Nature*, 341:159-62.

Anderson, P. et al., 1990. A monoclonal antibody reactive with a 15 kd cytoplasmic granule-associated protein defines a subpopulation of $CD8^+$ T lymphocytes. *Journal of Immunology*, 144:574-82.

Anderson, P. et al., 1990. Fcγ receptor type III (CD16) is included in the ζ NK receptor complex expressed by human natural killer cells. *Proceedings of the National Academy of Sciences USA*, 87:2274-78.

Taupin, J.L. and P. Anderson, 1994. Activation-induced proteolysis of the cytoplasmic Domain of ζ in T cell receptors and Fc receptors. *European Journal of Immunology*, 24:3000-3004.

ABSTRACT

Paul J. **Anderson**, the oldest of four children, was born in 1954; he grew up in a suburb of Syracuse, New York. His father was a school teacher and administrator, his mother a housewife. He discovered a love of science when he was about 10 years old, a love he nurtured through his B.S. degree in biology from the State University of New York (SUNY), Stony Brook in 1978. Biochemistry professor Bernard Dudock inspired Anderson to work part time in William Bauer's labs, where he was encouraged to design his own experiments, an unusual practice for undergraduates. At that time Bauer was working on DNA, and in his labs Anderson met Francis Crick. Anderson also was able to publish some articles about his work in those labs.

He then entered a joint MD/PhD program at New York University (NYU), receiving his MD in 1983 and his PhD in 1984. Interested in immunology, he specialized in rheumatology for his two clinical years at Brigham and Women's Hospital in Boston. During this period he became involved in the excitement of working on interferon and interferon receptors. He also began working at Stuart F. Schlossman's lab at the Dana-Farber Cancer Institute, where work was being done on different subpopulations of T lymphocytes in the peripheral blood.

Schlossman became a mentor to Anderson, whose biochemical background and focus on immunology led him to develop an assay to identify intracellular antigens. This involved developing a cytometric flow assay to screen for monoclonal antibodies. Anderson observed that natural killer cells express zeta, an antibody that reacts with cytotoxic lymphocytes. He tracked the antigen causing transplant rejection to cytotoxic granules, reinforcing the theory that the antibody could recognize a toxic molecule. It became clear that the full-length RNA-binding protein is involved somehow in signaling apoptotic death in cytotoxic lymphocyte target cells, and we now know in all cells. He helped found the biotechnology company Apoptosis Technology as a subsidiary of Immunogen; he has several patents.

Anderson finds science unpredictable when he enters new areas; this is exciting to him and is one of the main reasons he continues to love research science. He believes we will continue to learn more about the molecular mechanisms of apoptosis, which will allow us to interfere in the molecular cell death and thereby to control or cure various diseases and health problems like cancer or organ rejection.

UCLA INTERVIEW HISTORY

INTERVIEWER:

Steven J. Novak, Senior Editor, UCLA Oral History Program. B.A., History, University of Colorado; Ph.D., History, University of California, Berkeley; M.B.A., UCLA Graduate School of Management.

TIME AND SETTING OF INTERVIEW:

Place: Anderson's office, Dana-Farber Cancer Institute, Boston.

Dates, length of sessions: May 18, 1995 (112 minutes); May 19, 1995 (96); May 22, 1995 (70).

Total number of recorded hours: 4.6

Persons present during interview: Anderson and Novak.

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 consultants developed a topic outline. In preparing for this interview, Novak held a telephone pre interview conversation with Anderson to obtain extensive written background information (curriculum vitae, copies of published articles, etc.) and agree on a research and interviewing timetable. Novak further reviewed the documentation in Anderson'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 general background on the recent history of the biological sciences, Novak consulted such works as: J.D. Watson et al., The Molecular Biology of the Gene. 4th ed. Menlo Park, CA: Benjamin/Cummings, 1987 and Bruce Alberts et al., Molecular Biology of the Cell. 3d ed. New York: Garland, 1994.

The interview is organized chronologically, beginning with Anderson's childhood in Syracuse, New York, his education, internship, and residency, and the establishment of own laboratory at Dana-Farber Cancer Institute. Major topics discussed include interferon, T cell receptors, cytotoxic lymphocytes, apoptosis, immunology, rheumatology, and the biotechnology industry.

ORIGINAL EDITING:

Vimala Jayanti, editor, 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

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

Jayanti assembled the biographical summary. The interviewer prepared the table of contents, interview history, and index.

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