CHEMICAL HERITAGE FOUNDATION

RALPH C. BUDD

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview
Conducted by

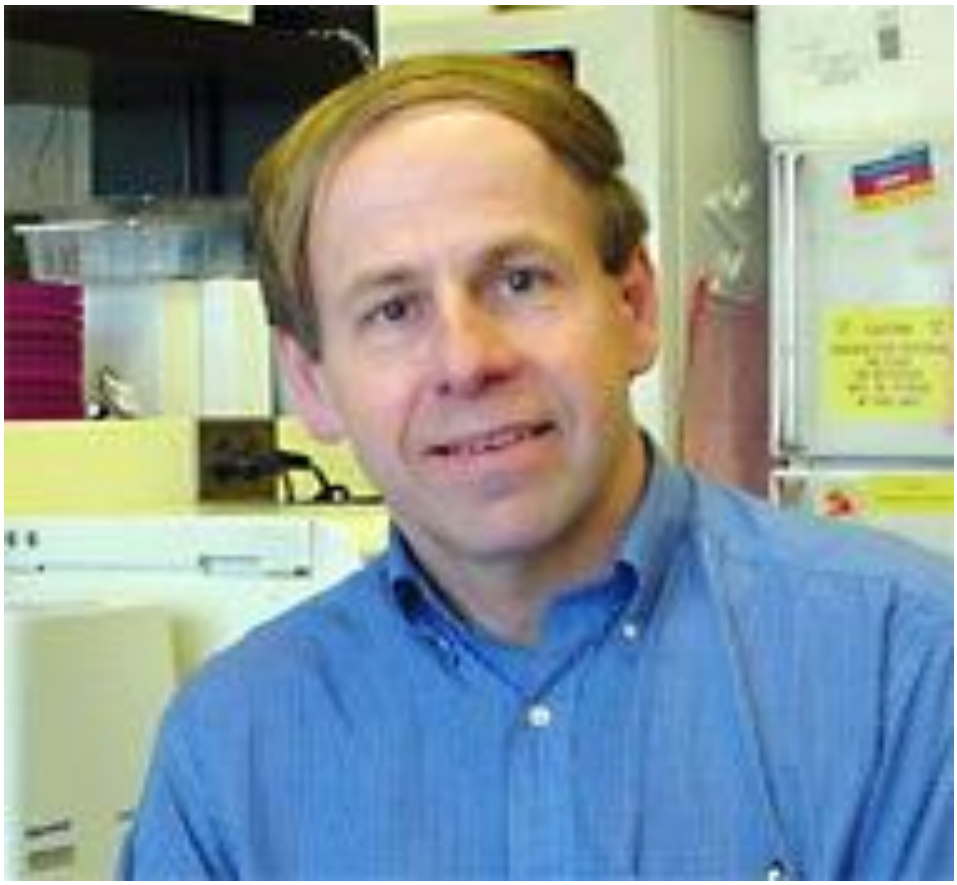
Steven J. Novak

at

University of Vermont
Burlington, VT

on

16-18 October 1994



Ralph C. Budd

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, 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. R941025

This Interview Agreement is made and entered into this 7th day of November, 1994 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 RALPH C. BUDD having an address at University of Vermont, Department of Medicine, Given Building, D-301, Burlington, Vermont, 05405, hereinafter called "Interviewee."

Interviewee agrees to participate in a series of University-conducted tape-recorded interviews, commencing on or about October 16, 1994, and tentatively entitled "Interview with Ralph C. Budd". 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 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: Ralph C. Budd
University of Vermont
Department of Medicine
Given Building, D-301
Burlington, VT 05405

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

INTERVIEWEE

Ralph Budd
(Signature)

Ralph C. Budd
(Typed Name)

University of Vermont

Department of Medicine

Given Building, D-301
(Address)

Burlington, VT 05405

Date 10/16/94

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

Carli V. Rogers
(Signature)

Carli V. Rogers
(Typed Name)

Copyright Officer
(Title)

Office of Research Administration
(Address)

Date November 7, 1994

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

RALPH C. BUDD

1951 Born in Elizabeth, New Jersey on 25 May

Education

1973 B.A., Cornell University
1977 M.D., Cornell University Medical College

Research Appointments

Dartmouth-Hitchcock Medical Center, Hanover, New Hampshire
1977-1978 Intern
1978-1979 Resident
1979-1980 Clinical Fellow
1979-1981 Senior Resident
1982-1984 Postdoctoral Research Fellow

1981-1982 Tompkins Community Hospital, Ithaca, New York
Attending Physician

1984-1987 Ludwig Institute for Cancer Research, Lausanne, Switzerland
Postdoctoral Research Fellow

1987-1988 Division of Immunology, Department of Medicine, Stanford University School of Medicine
Postdoctoral Research Fellow

Professional Experience

1988-1989 Division of Molecular Immunology, Genentech
Scientist

1988-1989 Stanford University School of Medicine
Clinical Assistant Professor of Medicine

University of Vermont College of Medicine, Rheumatology and Clinical Immunology Unit
1989-1992 Assistant Professor of Medicine

1992-present Associate Professor of Medicine

Honors

1974-1977	Joseph Collins Foundation Scholar, Cornell University Medical College
1983-1986	Arthritis Foundation Postdoctoral Fellow.
1989-1992	RJR Nabisco Research Scholars Award in Immunology
1990-1994	Pew Scholar in the Biomedical Sciences
1991-1994	Arthritis Foundation Biomedical Science Grant

Selected Publication

Budd, R.C. et al., 1985. Growth and differentiation *in vitro* of the accumulating Lyt-2-/L3T4 - subsets in *lpr* mice. *Journal of Immunology,* 135:3704-11.

Budd, R.C. and K.A. Smith, 1986. Immunoassay for interleukin 2 (IL-2) using monoclonal antibodies to human IL-2. *Bio-Technology,* 4:983-86.

Budd, R.C. and K.A. Smith, 1986. Interleukin 2 monoclonal antibody affinity adsorption: The critical role of binding kinetics for optimal immunoadsorption. *Journal of Immunological Methods,* 95:237-48.

Budd, R.C. et al., 1986. Cultured Lyt-2-L3T4 - T lymphocytes from normal thymus or *lpr* mice express a broad spectrum of cytolytic activity. *Journal of Immunology,* 137:3734-41.

Budd, R.C., 1986. Application of monoclonal antibody binding kinetics for immunopurification and immunoassay of interleukin 2. In *Monoclonal Antibodies: Basic Principles, Experimental and Clinical Applications in Endocrinology,* eds. G. Forti, M.B. Lipsett, M. Serio. New York: Raven Press, 275-83.

Budd, R.C. et al., 1987. Identification of memory cytolytic T lymphocytes in a subset of $CD8^+$ cells. *Journal of Immunology,* 138:1009-13.

Budd, R.C. et al., 1987. Distinction of virgin and memory T lymphocytes. Stable acquisition of the Pgp-1 glycoprotein concomitant with antigenic stimulation. *Journal of Immunology,* 138:3120-29.

Budd, R.C. et al., 1987. Selectivity increased production of interferon-gamma by subsets of $CD8^+$ and $CD4^+$ T cells identified by expression of Pgp-1. *Journal of Immunology,* 138:3583-86.

Budd, R.C. et al., 1987. Developmentally regulated expression of T cell receptor beta-chain variable domains in immature thymocytes. *Journal of Experimental Medicine,* 166:577-82.

Budd, R.C. et al., 1987. T cell lineages in the thymus of *lpr/lpr* mice: Evidence for parallel pathways of normal and abnormal T cell development. *Journal of Immunology,* 139:2200-2210.

Budd, R.C. et al., 1990. Intact antigen receptor-mediated generation of inositol phosphates and increased intracellular calcium in CD4-CD8 - T lymphocytes from MRL-*lpr* mice. *Journal of Immunology,* 145:2862-72.

Budd, R.C. et al., 1991. Elevated production of IFNÛ and IL4 by mature T cells from autoimmune *lpr* mice correlates with Pgp-1 (CD44) expression. *European Journal of Immunology,* 21:1081-84.

Budd, R.C. et al., 1992. CD2 expression correlates with proliferative capacity of Ţ13 + CD4-CD8 - T cells in *lpr* mice. *Journal of Immunology,* 148:1055-64.

Van Houten, N. and R.C. Budd, 1992. Accelerated programmed cell death of MRL-*lpr/lpr* T lymphocytes. *Journal of Immunology*, 149:2513-17.

Budd, R.C. and N. Van Houten, eds., 1994. Lessons from the *lpr* mouse: T lymphocyte development. *Seminars in Immunology*, 6: 1-69.

ABSTRACT

Ralph C. Budd grew up in Middletown, New York, in a close and happy family that included his parents and an older brother. He attended public schools, where he had good teachers who fostered his early interest and ability in science and mathematics. He attended MIT for his freshman year of college, but found it too intense; he transferred to Cornell University, which he very much preferred for academic reasons and because it is in a rural setting. There he continued studying the organ and sang in the University choir, where he met his future wife, Lenore Fritz. While Lenore was still an undergraduate Budd began medical school at Cornell University Medical School in New York City; they married and lived the commuter life for the remaining two years. During his residency at Dartmouth-Hitchcock Medical Center, Budd decided to specialize in rheumatology because it offered insight into many diseases and failings of the human body. He then began postdoctoral work in Kendall A. Smith's lab at Dartmouth College, where he found his medical practice and his research influencing each other, a pattern he continues to maintain. He went to Lausanne, Switzerland, to study T lymphocyte development in lymphoproliferative mice at the Ludwig Institute for Cancer Research. He returned to Stanford University to study immunology in C. Garrison Fathman's lab. He was heavily courted by Genentech and worked there for a year, until market forces forced cutbacks. From the West Coast he went to University of Vermont, where he continues to teach, mentor, review articles and papers, and do research. He believes that basic science is crucial, that attempting to direct results is counterproductive; but he is very interested in potential therapeutic applications of his research; viz. his research into *lpr* mice might provide help for lupus sufferers; and he thinks that *fas* gene studies have potential for sufferers of autoimmune diseases like rheumatoid arthritis. He and Lenore have a son, Graham, who is 10 years old; and a daughter, Laura, who is five years old. The family likes to engage in various outdoor activities and sports. Budd enjoys wine and espresso; he loves classical music, and plays the organ when he can find time.

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: Budd's office, University of Vermont.

Dates, length of sessions: October 16, 1994 (100 minutes); October 17, 1994 (118); October 18, 1994 (86).

Total number of recorded hours: 5

Persons present during interview: Budd 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 project consultants developed a topic outline. In preparing for this interview, Novak held a telephone preinterview conversation with Budd to obtain written background information (curriculum vitae, copies of published articles, etc.) and agree on an interviewing schedule. He also reviewed prior Pew scholars' interviews and the documentation in Budd'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, Novak consulted J.D. Watson et al., *The Molecular Biology of the Gene.* 4th ed. 2 vols. 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 Budd's childhood in Middletown, New York, and continuing through his education at Massachusetts Institute of Technology and Cornell University, his residency and postdoc at Dartmouth-Hitchcock Medical Center, postdocs at the Ludwig Institute for Cancer Research and Stanford University, and the setup of his own lab at the University of Vermont. Major topics discussed include training and mentors, collaborations, lab management, funding, and research on T lymphocytes in *lpr* mice, signal transduction, apoptosis and the *fas* gene, and the role of $\gamma\delta$ cells in Lyme arthritis.

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.

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

Kristian London, assistant editor, prepared the table of contents and interview history. Jayanti assembled the biographical summary. Gregory Beyrer, editorial assistant, compiled the index.

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