

CHEMICAL HERITAGE FOUNDATION

MICHAEL A. FARRAR

The Pew Scholars Program in the Biomedical Sciences

Transcript of Interviews
Conducted by

David J. Caruso

at

University of Minnesota
Minneapolis, Minnesota

on

13 and 14 August 2008

(With Subsequent Corrections and Additions)

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 Scholars Program in the Biomedical Sciences Advisory Committee members.

This oral history is made possible through the generosity of



CHEMICAL HERITAGE FOUNDATION
Oral History Program
FINAL RELEASE FORM

This document contains my understanding and agreement with the Chemical Heritage Foundation with respect to my participation in the audio- and/or video-recorded interview conducted by David Caruso on 13 and 14 August 2008. I have read the transcript supplied by the Chemical Heritage Foundation.

1. The recordings, transcripts, photographs, research materials, and memorabilia (collectively called the "Work") will be maintained by the Chemical Heritage Foundation and made available in accordance with general policies for research and other scholarly purposes.
2. I hereby grant, assign, and transfer to the Chemical Heritage Foundation all right, title, and interest in the Work, including the literary rights and the copyright, except that I shall retain the right to copy, use, and publish the Work in part or in full until my death.
3. The manuscript may be read and the recording(s) heard/viewed by scholars approved by the Chemical Heritage Foundation subject to the restrictions listed below. The scholar pledges not to quote from, cite, or reproduce by any means this material except with the written permission of the Chemical Heritage Foundation. Regardless of the restrictions placed on the transcript of the interview, the Chemical Heritage Foundation retains the rights to all materials generated about my oral history interview, including the title page, abstract, table of contents, chronology, index, et cetera (collectively called the "Front Matter and Index"), all of which will be made available on the Chemical Heritage Foundation's website. Should the Chemical Heritage Foundation wish to post to the internet the content of the oral history interview, that is, direct quotations, audio clips, video clips, or other material from the oral history recordings or the transcription of the recordings, the Chemical heritage Foundation will be bound by the restrictions for use placed on the Work as detailed below.
4. I wish to place the conditions that I have checked below upon the use of this interview. I understand that the Chemical Heritage Foundation will enforce my wishes until the time of my death, when any restrictions will be removed.

Please check one:

a. _____

No restrictions for access.

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 access. (May view the Work. My permission required to quote, cite, or reproduce.)

c. _____

Restricted access. (My permission required to view the Work, quote, cite, or reproduce.)

This constitutes my entire and complete understanding.

(Signature) _____

Dr. Michael A. Farrar

(Date) _____

4/20/2010

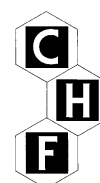
This interview has been designated as **Semi Restricted Access**.

One may view the oral history with the permission of CHF.
However, the permission of the interviewee is required to quote from, cite,
or reproduce the oral history.

Please contact CHF to request permission.



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



The Chemical Heritage Foundation (CHF) serves the community of the chemical and molecular sciences, and the wider public, by treasuring the past, educating the present, and inspiring the future. CHF maintains a world-class collection of materials that document the history and heritage of the chemical and molecular sciences, technologies, and industries; encourages research in CHF collections; and carries out a program of outreach and interpretation in order to advance an understanding of the role of the chemical and molecular sciences, technologies, and industries in shaping society.

MICHAEL A. FARRAR

1964 Born in Washington, D.C. on 5 May

Education

1987 B.S., University of Wisconsin, Madison, Molecular Biology
1993 Ph.D., Washington University School of Medicine, Immunology

Professional Experience

1993-1997 University of Washington, Seattle
Postdoctorate, Immunology under Roger M. Perlmutter

1997-2000 Merck Research Labs, Rahway, New Jersey
Postdoctorate, Immunology under Roger M. Perlmutter

2000-2006 University of Minnesota, Minneapolis
Assistant Professor, Center for Immunology, The Cancer Center,
and Department of Laboratory Medicine and Pathology

2006-present Associate Professor, Center for Immunology, The Cancer Center,
and Department of Laboratory Medicine and Pathology

Honors

1982-1983 Kemper K. Knapp Scholarship
1986 Phi Beta Kappa
1992-1993 Spencer T. and Ann W. Olin Medical Scientist Fellowship
1995-1997 Rudolf Montgelas Cancer Research Institute Postdoctoral Fellowship
2002-2006 Pew Scholar in the Biomedical Sciences
2004-2008 Cancer Research Institute Investigator Award
2006 AAI Junior Faculty Travel Award
2007-2012 Leukemia and Lymphoma Society Scholar Award

ABSTRACT

Michael A. Farrar was born in Washington, D.C., where his father was a chemist for the Bureau of Standards. Farrar's mother, a housewife, was German, and Farrar and his younger brother and sister grew up bilingual. As his father changed jobs, the family moved near to New York City, back to the D.C. area, and finally to Madison, Wisconsin, where the senior Farrar joined the faculty of the University of Wisconsin. By that time Farrar had begun high school. He liked to read and was interested in physics and astronomy, but not so much in biology. He crewed for his high school team and continued rowing throughout college.

Thinking of becoming an astrophysicist, Farrar entered the University of Wisconsin, intending to major in physics and mathematics. At the end of his junior year he attended some lectures given by Oliver Smithies and found them fascinating. In general, he found biology better taught and more interesting at the university, and so he changed his major to biology; during the summers he worked in a chicken lab trying to manipulate genes. Having started the biology program later in his undergraduate career, he decided to stay for a fifth year to complete a senior thesis. During his last semester he was diagnosed with Addison's disease.

Farrar decided to attend Washington University in St. Louis for a PhD in immunology. There he began work on interferon receptors in Robert Schreiber's lab; he won the Olin Medical Scientist Foundation Fellowship. He also took up bicycle racing. Taking advice from Schreiber and a number of others, Farrar accepted a postdoc at the University of Washington, working in Roger Perlmutter's lab on Ras signaling and B-cells, as well as developing a novel, chemical-induced dimerization system. He enjoyed new outdoor activities in Seattle, Washington, and continued biking as well.

After Farrar had been in Seattle for about four years, Perlmutter moved to Merck and Company, taking most of his lab, including Farrar, with him. There Farrar was able to design his own lab, to interview and recommend for hire the lab staff and technicians, and to buy whatever equipment he wanted. He learned a great deal about setting up and managing a lab from this experience. He was able to continue his previous work there too, but he had to find new athletic activities, this time rock climbing and ballroom dancing. He also met his future wife, a medical student at Albert Einstein College of Medicine. When it was time to look for a job Farrar had an offer from the University of Minnesota, and his wife was able to transfer her residency.

At the end of the interview Farrar discusses his continuing work on STAT; the politics of publishing; ethics in science; the increase in administrative duties, with its corresponding decrease in time for bench work; grants in general; the Pew Scholars Program in the Biomedical Sciences award in particular (and its annual meetings); recruiting students and getting his lab going; and patents. He describes how he tries to balance work life with spending time with his two children and his wife. He concludes his interview by discussing his newest work and its implications for human leukemia.

INTERVIEWER

David J. Caruso earned a B.A. in the History of Science, Medicine, and Technology from the Johns Hopkins University in 2001 and a Ph.D. in Science and Technology Studies

from Cornell University in 2008. His graduate work focused on the interaction of American military and medical personnel from the Spanish-American War through World War I and the institutional transformations that resulted in the development of American military medicine as a unique form of knowledge and practice. David is currently the Program Manager for Oral History at the CHF. His current research interest focuses on the discipline formation of biomedical science in 20th-century America and the organizational structures that have contributed to such formation.

TABLE OF CONTENTS

Early Years	1
First years in Washington, D.C., area; family background; several moves ending in Madison, Wisconsin. Bilingual childhood. Early interests and activities. Summers in Germany. School. Interests in physics and astronomy.	
College Years	13
Matriculates into University of Wisconsin. Continues rowing career into national championship. Knapp Scholarship. Began as mathematics and physics major; switched near end to biology. Immunology class with Oliver Smithies. Working in chicken lab with friend. Addison's disease.	
Graduate School Years	25
Decided on Washington University in St. Louis. Worked on interferon receptors in Robert Schreiber's lab. Taking up bicycle racing. Olin Fellowship. Writing papers. Mentoring style of Schreiber. Life in the lab.	
Postgraduate Years	49
Enters Roger Perlmutter's lab at University of Washington in Seattle, Washington. Works on regulation of lymphocyte development by STAT5. Outdoor activities. Perlmutter's management and mentoring style. Pressure to publish. Raf/Ras/MEK paper in <i>Nature</i> .	
Merck and Company Years	60
Perlmutter takes most of lab to Rahway, New Jersey, to work at Merck and Company. Independence of lab. Designing his own lab. Hiring staff. Rock climbing and ballroom dancing. Meets future wife. Job hunting.	
Faculty Years	69
Accepted position of assistant professor at University of Minnesota. Last months at Merck. Waiting for wife's residency transfer to Minnesota. Using experience from Merck to set up his own lab. A competitor becomes an ethics lesson. Politics of publishing. Less time in the lab; more administrative duties. Grants. Pew Scholars Program in the Biomedical Sciences grant and annual meetings. Comparing students now with students of his generation. Patents. Balancing life in the lab with life at home with physician wife and two children. Latest research and implications for leukemia.	
Index	107

INDEX

A

acquired immune deficiency syndrome, 25, 29
Addison's disease, 22, 33
adenosine triphosphate, 39, 41
Aguet, Michel, 35, 47, 79
AIDS. *See* acquired immune deficiency syndrome
alanine, 39
Alberola-Ila, Jose, 57, 59, 81
Albert Einstein College of Medicine, 66
Albert Einstein Medical Center, 66
aldosterone, 22
Allison, James P., 29
aspartic acid, 39
ATP. *See* adenosine triphosphate

B

B cell, 55, 68, 89, 93, 104
Bahamas, 85
Baldwin, Albert S., Jr., 75
B-cell linker protein, 104
BCR-ABL, 105
Becker, Wayne M., 19, 24
Behrens, Timothy W., 93
Berg, Leslie J., 72
Bethesda Maryland, 95
Bevan, Michael J., 61, 70
Bill and Melinda Gates Foundation, 49
Binsinger, Steven J., 76
BLNK. *See* B-cell linker protein
Blue Ridge Mountains, 5
Boston, Massachusetts, 25
Brandeis University, 26
Burchill, Matthew A., 75, 89, 90, 91, 98, 99

C

CaaX, 55
Calderon, Jesus, 36
Cambodia, 94

Cambridge, England, 2, 3
Camilli, Andrew, 31
Canada, 94
Caribbean Sea, 85
Cascade Mountains, 58
Champaign, Illinois, 2
Chapel Hill, North Carolina, 75
Charles River, 25
China, 49
Chinese, 88, 100
Chinnaiyan, Arul M., 87
chromatography
 column chromatography, 21
 ion exchange chromatography, 21
Collins, Marion (wife), 67, 74
Columbia University, 61, 62, 88
Concern Foundation, 105
coumermycin, 54, 56
Crabtree, Gerald R., 53, 56, 63, 83
Cranford, New Jersey, 1, 6, 7
Cre-mediated recombinase, 52
Crick, Francis H.C., 96
Csk. *See* c-src tyrosine kinase
c-src tyrosine kinase, 52, 53

D

Darnell, James E., 41
Denver, Colorado, 98
Didier, Daniel K., 32
Dighe, Anand S., 47, 58
DiMartino, Julie, 102
DNA, 33, 54
 cDNA, 35, 58, 87, 103
Dörfler, Petra, 62
Dounce, 41
Duesberg, Peter H., 29
Dyer, Michael A., 87

E

Edmund Scientific, 4
Einstein, Albert, 66, 96

F

Fernandez-Luna, Jose L., 35, 37, 38
FITC. *See* fluorescein isothiocyanate
fluorescein isothiocyanate, 22
fyn, 52

G

Garotta, Gianni, 39
Genentech Incorporated, 35, 45, 47, 78, 93,
102
George Washington University, 1
German, 3, 5, 7, 15, 16
Germany, 3, 5, 11, 65
Gleevec, 105
Goetz, Christine A., 73, 76, 79, 94, 98, 100
Gray, Patrick W., 35, 47
Greenlund, Andrew C., 42, 47, 58, 59
gurgit, 39
gyrB, 56

H

Hancock, John F., 55
Harvard University, 26, 76, 99
histidine, 39
History of Mankind, 11
HIV. *See* human immunodeficiency virus
Hodgkin's Lymphoma, 76
Hoffman-LaRoche Ltd., 39
Hogquist, Kristin A., 70, 73
Holers, Michael, 34
Howard Hughes Medical Institute, 32, 34,
37, 48, 60, 61, 70, 75, 98
human immunodeficiency virus, 25, 29, 88
hybridomas, 34, 37, 48

I

IgG. *See* Immunoglobulin G
IL-2. *See* interleukin-2
Immunoglobulin G, 22
India, 49
interferon, 34, 35, 38, 39, 41, 42, 45, 47, 48,
78, 79
interferon gamma, 34, 35
interferon-stimulated gene factor 3, 41

interleukin-15, 91
interleukin-2, 88, 90, 91, 92
interleukin-4, 78
Iritani, Brian M., 59, 63
ISGF3. *See* interferon-stimulated gene
factor 3

J

Jak, 58, 102
Jameson, Steven C., 70
Japan, 1, 6, 42, 90
Japan Electron Optics Laboratory
Company, Ltd, 1
Jenkins, Marc K., 71, 75, 83, 89
Johns Hopkins University, 23, 101

K

Kansas, 2, 9
Kaplan, Daniel H., 45, 47
Karplus, Martin, 26
Kedl, Ross M., 98
Kemper K. Knapp Scholarship, 16, 17
Kensington, Maryland, 1, 2
Khurana Hershey, Gurjit, 37
Klausner, Richard D., 49, 50
Klein, Ludger, 91
Kornblau, Steven M., 105

L

lck. *See* leukocyte-specific protein tyrosine
kinase
leucines, 39
leukemia, 104, 105
Leukemia and Lymphoma Society Scholar
Award, 105
leukocyte-specific protein tyrosine kinase,
52
Linden, New Jersey, 65
Los Angeles, California, 105
Lüderitz, 11
Lutheran Church
Missouri Synod, 7

M

M.D. Anderson Cancer Center, 105
Madison, Wisconsin, 2, 3, 9, 10, 13, 14, 15, 16
major histocompatibility complex, 32, 33, 34, 38, 54
 class II molecules, 32, 33
Marrack, Phillipa F.R.S., 98
Marshall, Christopher J., 55
Maryland, 1, 2, 5, 9, 13
Massachusetts Institute of Technology, 77
Mello, Craig C., 97
Merck and Co., Inc., 53, 59, 60, 61, 62, 63, 65, 67, 68, 69, 70, 71, 72, 102, 103, 104
Mescher, Matthew F., 67, 73, 83
Mexico, 36
MHC. *See* major histocompatibility complex
Minneapolis, Minnesota, 1, 75
Minnesota, 75, 85
MIT. *See* Massachusetts Institute of Technology
Monsanto, 37
Montefiore Medical Center, 66
Mueller, Daniel L., 71

N

National Bureau of Standards, 1, 2, 7
National Cancer Institute, 49
National Institute of Standards and Technology, 1
National Institutes of Health, 49, 77, 80, 92, 93, 94, 95, 97
 Exploratory/Development Research Grant, 93
 Research Supplement to Support Diversity in Health-Related Research, 93
National Jewish Medical Center, 98
National Merit Scholarship, 14
National Science Foundation, 2, 8, 27
NCI. *See* National Cancer Institute
New Jersey, 3, 5

New York City, New York, 1, 11, 61, 65, 66
NIH. *See* National Institutes of Health
nitric oxide, 79
NMR. *See* nuclear magnetic resonance
Nobel Prize in Physiology and Medicine, 20, 96
Norment, Anne, 61
NSF. *See* National Science Foundation
nuclear magnetic resonance, 1, 7

O

O'Neil, Edward H., 84
O'Neil, Jennifer J., 73
Oldstone, Michael B., 83

P

Pagels, Heinz R., 11
Peet, Richard, 59
Perlmutter, Roger M., 48, 52, 53, 55, 57, 59, 60, 61, 62, 68, 69, 72, 74, 75, 81, 92
Pestka, Sidney, 35
Peters, Marion G., 34, 47
Petrovich, Michael B., 18
Petsko, Gregory A., 26
Pew Charitable Trusts, 68
Pew Latin American Fellows Program in the Biomedical Sciences, 85
Pew Scholars in the Biomedical Sciences, 1, 19, 31, 50, 70, 81, 82, 83, 84, 87, 88, 89, 92, 103
Philadelphia, Pennsylvania, 3, 66
phospho-STAT5, 105
Pike, Linda J., 48
Porter, Gene, 65
Portnoy, Daniel, 31
Potomac, Maryland, 2

R

Raf, 55, 56, 57, 59, 63, 76, 93
 A-Raf, 55
 B-Raf, 55
 C-Raf, 55
Rahway, New Jersey, 61, 64, 65

Ras, 71
Ras/Raf/MEK kinase, 54
Ridge, John P., 5, 93
Rock, Kenneth L., 71
Rockefeller University, 41, 103
Rockville, Maryland, 2
Rudensky, Alexander Y., 91
Rutgers, the State University of New Jersey,
35

S

Sagan, Carl, 11
Sakaguchi, Shimon, 90
Sakano, Hitoshi, 29
San Diego, California, 85
Sanger Center., 96
Sanger, Frederick, 96
Sauer, Karsten, 62, 65, 103
Schreiber, Robert D., 32, 34, 36, 37, 38, 39,
42, 44, 46, 47, 48, 52, 58, 74, 78, 102,
103
Schreiber, Stuart L., 53, 56, 63
Schwartz, Benjamin D., 32, 37
Scolnick, Edward M., 61
Seattle, Washington, 51, 52, 58, 59, 60, 61,
70, 75, 103
serines, 39
Sharp, Phillip A., 33
Sheehan, Kathleen, 37, 47
Shenandoah National Park, 5
Shimizu, Yoji, 71
signal transducers and activators of
transcription
STAT1, 41, 42
STAT5, 41, 76, 88, 89, 90, 91, 93, 104,
105
Singh, Harinder, 33
Sloan-Kettering Institute, 29
Smithies, Oliver, 20, 21, 25
Spencer T. and Ann W. Olin Medical
Scientist Fellowship, 46
Src homology 2, 41
St. Jude Children's Research Hospital, 87
St. Louis, Missouri, 29, 37
St. Olaf College, 73

Stanford University, 28, 103
STAT1. *See* signal transducers and
activators of transcription
STAT5. *See* signal transducers and
activators of transcription
Sumerians, 11

T

Tarakhovsky, Alexander, 53
T-cell, 49, 52, 54, 55, 59, 62, 71, 88, 89, 90,
91, 92, 93
CD25+, 89
CD4+, 71, 89, 90
CD8+, 90
Temple University Hospital, 66
Thomas, Matthew L., 9, 19, 38, 48
threonines, 39
Tufts University, 31
Turka, Laurence A., 76
tyrosine, 39, 40, 42

U

Ulrich, Michael, 32
Unanue, Emil R., 46, 47, 63, 83
University of California, Berkeley, 28
University of California, San Francisco, 31,
40
University of Chicago, 71
University of Illinois, 2
University of Massachusetts Medical
School, 71
University of Minnesota, 1, 51, 66, 70, 72,
73, 81, 99
University of North Carolina, 75
University of Oregon, 2, 27
University of Pennsylvania, 76
University of Washington, 51, 57, 60, 69,
71, 75
University of Wisconsin, 2, 14, 15, 16, 101
Urbana, Illinois, 2

V

Van Loon, Hendrik Willem, 11
Van Parijs, Luk, 77

Vang, Kieng Bao, 89, 94, 95, 100
Vilcek, Jan T., 103

W

Warren, Graham, 86
Washington University in St. Louis, 22, 26,
28, 29, 30, 34, 35, 37, 46, 47, 57, 63, 70,
71, 76, 97, 99, 102
Washington, DC, 1, 2
Watson, James D., 96
Weaver, Casey T., 46
Weber, Jason D., 87
Welsh, Raymond M., Jr., 72
Wentworth, Bernard C., 20

Wiesel, Torsten N., 86
Williams, Lewis T., 40, 48
Wilson, Thomas E., 19
Worcester, Massachusetts, 71
World War I, 11
World War II, 5, 11, 12

Y

Yale University, 76, 77

Z

Zou, Yong-Rui, 88
Zurich, Switzerland, 35