

CHEMICAL HERITAGE FOUNDATION

PAUL D. GOLLNICK

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview
Conducted by

Andrea R. Maestrejuan

at

The State University of New York, Buffalo
Buffalo, New York

on

12-14 October 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 the Pew Scholars Program in the Biomedical Sciences Advisory Committee members.

This oral history was completed under the auspices of the Oral History Project, University of California, Los Angeles (Copyright © 1999, The Regents of the University of California) and is made possible through the generosity of



**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. 7012699E

This Interview Agreement is made and entered into this 27th day D. of January, 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 PAUL D. GOLLNICK, having an address at Department of Biological Sciences, State University of New York at Buffalo, Buffalo, New York 14260, hereinafter called "Interviewee."

Interviewee agrees to participate in a series of University-conducted tape-recorded interviews, commencing on or about October 12, 1998, and tentatively entitled "Interview with Paul D. Gollnick". 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: _____

If to Interviewee: Paul D. Gollnick
Department of Biological Sciences
State University of New York at Buffalo
Buffalo, New York 14260

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

INTERVIEWEE

THE REGENTS OF THE UNIVERSITY
OF CALIFORNIA

Paul Gollnick
(Signature)

Dale E. Treleven
(Signature)

Paul D. Gollnick
(Typed Name)

Dale E. Treleven
(Typed Name)

Department of Biological
Sciences

Director, Oral History Program

(Title)

State University of New York
at Buffalo
(Address)

Buffalo, New York 14260

Date 10-12-98

Date 1/27/99

Pew Scholars in the Biomedical Sciences
Chemical Heritage Foundation Internet Posting Release Form

I, Paul D. Gollnick, 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. _____

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.



Paul D. Gollnick, Ph.D.

2-4-08

Date

This interview has been designated as **Free Access**.

One may view, quote from, cite, or reproduce the oral history with the permission of CHF.

Please note: Users citing this interview for purposes of publication are obliged under the terms of the Chemical Heritage Foundation Oral History Program to credit CHF using the format below:

Paul D. Gollnick, interview by Andrea R. Maestresjuan at the State University of New York, Buffalo, Buffalo, New York, 12-14 October 1998 (Philadelphia: Chemical Heritage Foundation, Oral History Transcript # 0443).



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.

PAUL D. GOLLNICK

1958 Born in Pullman, Washington on 6 December

Education

1981 B.S., Washington State University
1986 Ph.D., Iowa State University

Professional Experience

1986-1990 Stanford University
Postdoctoral Fellow

1990-1996 State University of New York at Buffalo
Assistant Professor
1996-present Associate Professor

Honors

1986-1989 American Cancer Society Postdoctoral Fellowship
1990 American Heart Society Postdoctoral Fellowship
1993-1997 Pew Scholarship in the Biomedical Sciences

Selected Publications

- Gollnick, P. and C. Yanofsky, 1990. tRNA^{Trp} translation of leader peptide codon 12 and other factors that regulate expression of the tryptophanase operon. *Journal of Bacteriology* 172: 3100-3107.
- Gollnick, P. et al., 1990. The *mtr* locus is a two gene operon required for transcription attenuation in the *trp* operon of *Bacillus subtilis*. *Proceedings of the National Academy of Sciences USA* 87:8726-30.
- Yanofsky, C. et al., 1991. Physiological studies on tryptophan transport and tryptophanase operon induction in *Escherichia coli*. *Journal of Bacteriology* 173:6009-17.
- Antson, A.A. et al., 1993. The three-dimensional structure of tyrosine phenol-lyase. *Biochemistry* 32:4195-206.
- Otridge, J. and P. Gollnick, 1993. MtrB from *Bacillus subtilis* binds specifically to *trp* leader RNA in a tryptophan dependent manner. *Proceedings of the National Academy of Sciences USA* 90:128-32.

- Antson, A.A. et al., 1995. The three-dimensional structure of *trp* RNA-binding attenuation protein. *Nature* 374:693-700.
- Baumann, C. et al., 1996. Kinetic and thermodynamic analysis of the interaction between TRAP (*trp* RNA-binding attenuation protein) and *trp* leader RNA from *Bacillus subtilis*. *Journal of Biological Chemistry* 271:12269-74.
- Yang, M. et al., 1997. Alanine-scanning mutagenesis of *Bacillus subtilis trp* RNA-binding attenuation protein (TRAP) reveals residues involved in tryptophan binding and RNA binding. *Journal of Molecular Biology* 270:696-710.
- Baumann, C. et al., 1997. The *trp* RNA-binding attenuation protein (TRAP) from *B. subtilis* binds to unstacked *trp* leader RNA. *Journal of Biological Chemistry* 272:19863-69.
- Xirasagar, S. et al., 1998. RNA structure inhibits the TRAP (*trp* RNA-binding attenuation protein)-RNA interaction. *Journal of Biological Chemistry* 273:27146-53.
- Chen, X.-P. et al., 1999. Regulatory features of the *trp* operon and the crystal structure of the *trp* RNA-binding attenuation protein from *Bacillus stearothermophilus*. In press.

ABSTRACT

Paul D. Gollnick was born and mostly raised in Pullman, Washington. For one year when he was about 10 (or else in eighth grade) he and his family lived in Stockholm, Sweden, where his father was on sabbatical. Because his father was a scientist, an exercise physiologist, Paul was, from a young age, disposed to enter science himself. Reinforcing that desire were hours spent helping his father in his father's lab, and a high-school chemistry teacher who also inspired him. Paul's mother was a musician and music teacher but was unable to interest any of her children in music. Paul was not adept at most sports, he says, but he did take up and continues to enjoy golf.

When he was deciding about college, he had to stay in state for financial reasons; he chose Washington State because he believed they had better science programs. He decided to major in biochemistry because he had discovered an interest in biology as well as chemistry and thought that biochemistry nicely combined the two. Biochemistry majors were new around the country at that time, so he felt also that the field would be dynamic and exciting. As an undergraduate he worked in Bruce McFadden's laboratory, producing an enzyme inhibitor. Realizing that working in pure science would require a graduate degree, he entered Iowa State University.

At Iowa State Gollnick had hoped to work with Stanley Cox, who was studying gene expression in HeLa cells, but Cox was not headed for tenure, so Gollnick ended up working for Jack Horowitz. In Horowitz's lab Gollnick worked on nucleic acids and tRNA. Though he was frustrated at having to use the old-fashioned nuclear magnetic resonance technique because Horowitz had declared, "No recombinant DNA in my centrifuge," Gollnick says that, "...in retrospect it was fine." While at Iowa State Gollnick met and married Sandra Opper, a classmate. Together they went to Stanford, where for four years, Gollnick did postdoc work in Charles Yanofsky's lab and Sandra worked for DNAX. Gollnick's research was going nowhere, so when she left the lab, Mitzi Yukoda gave Gollnick her work on subcloning and sequencing *mtrb*.

With Yanofsky's permission and with TRAP (*trp* RNA-attenuation protein) in hand, Gollnick applied for faculty positions. He accepted an assistant professorship at SUNY Buffalo, and his wife was able to find a job at Roswell Park Cancer Center. Gollnick continues his study of TRAP in *B. subtilis* and his collaborative work with Robert S. Phillips on tryptophanase. He has since become an associate professor and received tenure. Gollnick teaches a great deal and likes it very much. He also continues to publish and to work occasionally at the bench.

UCLA INTERVIEW HISTORY

INTERVIEWER:

Andrea R. Maestrejuan, Interviewer, UCLA Oral History Program; B.A., History, University of California, Irvine, 1988; 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: Gollnick's office, State University of New York at Buffalo.

Dates, length of sessions: October 12, 1998 (83 minutes); October 13, 1998 (126); October 14, 1998 (130).

Total number of recorded hours: 5.6

Persons present during interview: Gollnick 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 Gollnick 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 Gollnick'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 Gollnick's childhood in Pullman, Washington, and continuing through his undergraduate work at Washington State University, his graduate work at Iowa State University, his postdoc at Stanford University, and the establishment of his own lab at State University of New York at Buffalo.

Major topics discussed include subcloning and sequencing of *mtrb*; Gollnick's identification of the *trp* RNA-binding attenuation protein; and the funding of science in the United States.

ORIGINAL EDITING:

Cecily Hurst, 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.

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

William Van Benschoten, editor, prepared the table of contents, biographical summary, and interview history. Hurst compiled the index.

TABLE OF CONTENTS

Early Years	1
Family background. His father's scientific research. An influential high school chemistry teacher. Learning scientific principles from his father. Early schooling in Pullman, Washington. Interest in golf. Religious background.	
College Years	18
Decision to attend Washington State University (WSU) and major in biochemistry. The biochemistry program at WSU. Gollnick's coursework. Producing an enzyme inhibitor in the Bruce A. McFadden lab.	
Graduate and Postgraduate Years	36
Choosing a graduate school--Enters the Jack Horowitz lab at Iowa State University. Teamwork in science. The rewards of a career in science. Gollnick's first publication. His frustration at not being allowed to use the latest scientific techniques in the Horowitz lab. Meets his future wife, Sandra Oppel, at Iowa State. Enters the Charles Yanofsky lab at Stanford. Spends several years in Yanofsky's lab looking for a nonexistent repressor protein. Assumes <i>mtrb</i> subcloning and sequencing project begun by Mitzi Kuroda.	
Faculty Years	61
Interviewing for faculty positions. Accepts assistant professor position at State University of New York (SUNY) at Buffalo. Balancing the goals of a two-career couple. Gollnick arranges to take research with him when he leaves the Yanofsky lab. His relationship with Yanofsky. Gollnick's reasons for pursuing the RNA-binding protein project in <i>B. subtilis</i> . Competition and cooperation between Gollnick and Yanofsky on TRAP. Gollnick lab's future projects. Funding Gollnick's collaboration with Robert S. Phillips on the enzymology of tryptophanase. Collaborating with Tatyana V. Demidkina in Russia. Associate professorship and tenure. His teaching responsibilities. Relative importance of teaching and research at SUNY-Buffalo. Role of gender in academic hiring and the selection of lab personnel.	
Index	104

INDEX

- 1**
¹⁹fluorine, 40
- A**
acquired immunodeficiency syndrome, 80
ACS. *See* American Chemical Society
AIDS. *See* acquired immunodeficiency syndrome
Alcon Laboratories, 64
American Cancer Society, 82
American Chemical Society, 38
American Society for Biochemistry and Molecular Biology, 50
American Society for Biological Chemistry, 50
Ames, Iowa, 5, 7, 17, 45, 46, 47, 51, 62
Anaheim, California, 50
Antson, Alfred A., 85, 95
ASBC. *See* American Society for Biological Chemistry
ASBMB. *See* American Society for Biochemistry and Molecular Biology
Australia, 84
- B**
Babitzke, Paul, 60, 65, 67, 70, 72, 73, 85
Bacillus subtilis, 51, 55, 56, 59, 63, 68, 72, 81
Baylor College of Medicine, 64
biochemistry, 11, 20, 21, 22, 23, 25, 26, 28, 29, 30, 38, 40, 42, 55, 62, 65, 67, 75, 76, 80, 85, 89
Brody, Edward, 95
Buffalo, New York, 62, 64, 83
- C**
California Institute of Technology, 86
Caltech. *See* California Institute of Technology
Cech, Thomas R., 43, 44, 45
cell biology, 26
Colorado Springs, Colorado, 18
Cornell University, 51
Cox, Stanley, 27, 30, 38, 39, 46
Crawford, Irving P., 55, 70, 73
crystallography, 85
- D**
Dallas, Texas, 62
Demidkina, Tatyana V., 85, 95
Denmark, 9
DNA, 25, 27, 40, 50, 56, 57, 59, 69, 80
DNAX Research Institute, 49, 63
Drosophila, 55, 73, 74
- E**
E. coli, 50, 51, 69, 102
Elledge, Steven J., 54
EndNote, 6
England, 85, 94, 95, 96
enzymology, 27, 30, 38, 44, 46, 84, 85
eucaryote/eucaryotic, 27, 51, 71, 72, 74, 75, 78, 83
exercise physiology, 2, 7, 16
- F**
FASEB. *See* Federation of American Societies for Experimental Biology
Federation of American Societies for Experimental Biology, 50
FIRST Award. *See* First Independent Research Support and Transition
First Independent Research Support and Transition, 77
Florida, 5
flurouracil, 40
Flynn, Peter F., 96, 102
Fort Worth, Texas, 62
France, 94
Fromm, Herbert J., 30, 38

G

Genentech, 49
Germany, 2, 94
glycolate, 24
glycolysis, 89
Gollnick, Brian (brother), 3, 4
Gollnick, Charles (brother), 3, 4
Gollnick, Doris Spangler (mother), 1
Gollnick, Philip D. (father), 1, 2
Gollnick, Sandra Oppel (wife), 17, 47, 48,
54, 57, 62, 63, 74, 84, 93, 97, 98

H

Harvard University, 86
HeLa, 30, 39
Hendrick, Philip W., 25
HIV. *See* human immunodeficiency virus
Hoch, Sallie O'Neil, 55, 58, 73
Horowitz, Jack, 30, 38, 39, 43, 44, 45, 46
Houston, Texas, 64
Howard Hughes Medical Institute, 86
Howard Hughes Medical Institute
International Program for Collaboration
with Biomedical Scientists, 82, 84, 85
Howard Hughes Medical Investigators, 86
human immunodeficiency virus, 68, 80
hunchback, 74
Hungary, 86

I

Idaho, 3
Immologic Pharmaceutical Corporation, 64
Iowa State University, 5, 29, 30, 38, 46, 50,
54

J

John E. Fogarty International Center, 85
Johnson, George, 11

K

Kahn, Michael L., 30
Karolinska Institut, 8
Knoxville, Tennessee, 62
Kornberg, Arthur, 25, 39

Koudelka, Gerald B., 80
Kuroda, Mitzi I., 52, 54, 55, 56, 57, 58, 59,
65, 69, 73, 86

L

La Crosse, Wisconsin, 1
lac operon, 26
lambda clone, 55, 59
Landick, Robert, 44
Los Angeles, California, 83
Lutheran, 16, 17

M

Massachusetts Institute of Technology, 86
McFadden, Bruce A., 24, 29, 37, 38, 41
methyltryptophan resistance, 55, 57
methyltryptophan resistance B, 73, 74
Metzler, David E., 29, 30
Mexico, 6
Milesca, Mirela, 73
MIT. *See* Massachusetts Institute of
Technology
mtr. *See* methyltryptophan resistance
myotonic dystrophy, 80

N

NASA. *See* National Aeronautics and Space
Agency
National Aeronautics and Space Agency, 7
National Institutes of Health, 71, 73, 77, 78,
79, 80, 82, 85, 96, 102
National Science Foundation, 71, 75, 77,
78, 79, 80, 83
Neurospora, 51, 81
New York City, New York, 62
Niagara Falls, 85
Nicholson, Bruce J., 93
NIH. *See* National Institutes of Health
NMR. *See* nuclear magnetic resonance
Northeastern University, 54
NSF. *See* National Science Foundation
nuclear magnetic resonance, 39, 40, 42, 43,
44, 50, 80

O

Oklahoma, 48
Orbach, Marc J., 54
Otridge, John, 88

P

Pall, Martin L., 30
Palo Alto, California, 46, 51
Palouse, 1
Pennsylvania State University, 70, 72
Pew Charitable Trusts, 86
Pew Scholars in the Biomedical Sciences,
12, 33, 36, 72, 73, 76, 78, 80, 82, 83, 84,
86, 88, 91, 93, 101
Phillips, Robert S., 84, 85
Portland, Oregon, 5
procaryote/procaryotic, 27, 54, 72, 77
Pullman, Washington, 1, 3, 4, 8, 13, 14, 17,
45, 46

R

RefManager, 6
Rev, 68
ribonucleic acid, 27, 40, 43, 44, 55, 59, 67,
68, 69, 70, 75, 76, 80, 101, *See*
ribonucleic acid
RNA
tRNA, 39, 40, 41, 42, 43, 44, 48
Roach, Daniel J.W., 24, 37
Roswell Park Cancer Institute, 49, 64, 65,
93, 97
Russia, 82, 84, 85, 94, 95

S

sac, 57
San Francisco, California, 83
Schering-Plough Research Institute, 49
Siegler, Paul B., 69
Spokane, Washington, 3
Stanford University, 7, 45, 47, 49, 50, 86
State University of New York, 62
State University of New York at Buffalo,
72, 77, 93
State University of New York at Stony

Brook, 91

Stewart, Valley J., 51, 52
Stockholm, Sweden, 8
Storrø, Ivar, 24
SUNY. *See* State University of New York

T

Tacoma, Washington, 6
Tat, 68
TCA. *See* tricarboxylic acid
Tetrahymena, 82
TPL. *See* tyrosine phenol-lyase
TRAP. *See* *trp* RNA attenuation protein
tricarboxylic acid, 89
trp. *See* tryptophan biosynthetic genes
trp RNA attenuation protein, 59, 67, 69, 70,
73, 74, 75, 76, 80, 81, 85, 101, 102
tryptophan biosynthetic genes, 50, 51, 52,
59, 66, 68, 69, 73, 103
tryptophanase, 51, 52, 54, 55, 61, 68, 84
tyrosine phenol-lyase, 84

U

Uhlenbeck, Olke C., 40
Union Carbide Corporation, 58
Union of Soviet Socialist Republics, 85
University of California at San Diego, 6
University of California Davis, 30, 38
University of California, San Diego, 29
University of Colorado, 40
University of Georgia, 84
University of Hawaii, 62
University of Iowa, 55
University of Miami at Ohio [Miami
University], 62
University of Oregon, 30
University of Puget Sound, 6
University of Southern California, 91
University of Tennessee, 62
University of Texas at Arlington, 62
University of Washington, 14, 18, 29
University of Wisconsin-La Crosse, 1
UPS. *See* University of Puget Sound
uracil, 40
USC. *See* University of Southern California

V

VAX. *See* virtual address extension
virtual address extension, 48

W

Warner, Carol M., 54
Washington State University, 1, 2, 14, 18,
20, 24, 28, 37, 91
Weaver, Robert F., 25

Westfield, Wisconsin, 1
Wisconsin, 5

Y

Yale University, 86
Yanofsky, Charles, 44, 45, 48, 49, 51, 52,
54, 56, 58, 59, 60, 63, 65, 66, 67, 70, 73,
84, 97, 103
Yount, Ralph G., 29