CHEMICAL HERITAGE FOUNDATION

JAMES A. BOROWIEC

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview
Conducted by

Neil D. Hathaway

at

New York University Medical Center
New York City, NY

on

14, 17, and 23 September 1993 and 1, 9, and 10 October 1993

From the Original Collection of the University of California, Los Angeles

James A. Borowiec

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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UNIVERSITY OF CALIFORNIA, LOS ANGELES

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If to Interviewee: James A. Borowiec
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University and Interviewee have executed this Agreement on the date first written above.

INTERVIEWEE

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Date 9/14/93

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James A. Borowiec, Ph.D.

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JAMES A. BOROWIEC

1958 Born in Buffalo, New York on 6 July

Education

1980 B.S., Organic Chemistry, Georgia Institute of Technology
1986 Ph.D., Chemistry and Biochemistry, University of California, Los Angeles

Research Appointments

1986-1989 Memorial Sloan-Kettering Cancer Center, New York City
Postdoctoral Fellow, Department of Molecular Biology, Laboratory of Dr. Jerard Hurwitz

Professional Experience

1989-present New York University Medical Center, New York City
Assistant Professor, Department of Biochemistry

Honors

1982-1985 United States Public Health Service National Research Service Award
1986-1989 National Institutes of Health Postdoctoral Fellowship
1990-1998 National Institutes of Health Grant
1990-1994 Scholar, Pew Scholars Program in the Biomedical Sciences
1991 Yamagiwa-Yoshida Memorial International Cancer Study Grant

Selected Publications

Borowiec, et al., 1980. Interference effects from aerosol ionic redistribution in analytical atomic spectrometry. *Analytical Chemistry,* 52:1054-59.

Borowiec, J. and J. Gralla, 1985. The *in vitro* supercoiling response of the *lac* p^s promoter. *Journal of Molecular Biology,* 184:587-98.

Borowiec, J. and J. Gralla, 1985. Interaction of RNA polymerase with the *lac* p^s promoter *in vivo* and *in vitro.* In *Sequence Specificity in Transcription and Translation,* eds. L. Gold and R. Calender. New York: Alan R. Liss.

Borowiec, J. and J. Gralla, 1986. High-resolution analysis of *lac* transcription complexes inside cells. *Biochemistry,* 25:5051-57.

Borowiec, J. and J. Gralla, 1987. All three elements of the *lac* p^s promoter mediate its transcriptional response to DNA supercoiling. *Journal of Molecular Biology,* 195:89-98.

Borowiec, J. et al., 1987. DNA supercoiling promotes formation of a bent repression loop in *lac* DNA. *Journal of Molecular Biology,* 196:101-11.

Borowiec, J. and J. Hurwitz, 1988. ATP stimulates the binding of simian virus 40 (SV40) large tumor antigen to the SV40 origin of replication. *Proceedings of the National Academy of Sciences USA,* 85:64-68.

Borowiec, J. and J. Hurwitz, 1988. Localized melting and structural changes in the SV40 origin of replication induced by T-antigen. *EMBO Journal,* 7:3149-58.

Borowiec, J. et al., 1990. Binding and unwinding—how T-antigen engages the SV40 origin of DNA replication. *Cell,* 60:181-84.

SenGupta, D.J. and J. Borowiec, 1992. Strand-specific recognition of a synthetic DNA replication fork by the SV40 large tumor antigen. *Science,* 256:1656-61.

Borowiec, J., 1992. Inhibition of structural changes in the simian virus 40 core origin of replication by mutation of essential origin sequences. *Journal of Virology,* 66:5248-55.

SenGupta, D.J. and J.A. Borowiec, 1994. Strand and face: The topography of interactions between the SV40 origin of replication and T-antigen during the initiation of replication. *EMBO Journal,* 13:982-92.

Blackwell, L.J. and J.A. Borowiec, 1994. Human replication protein A binds single-stranded DNA in two distinct complexes. *Molecular and Cell Biology,* 14:3993-4001.

Gillette, T. and J.A. Borowiec, 1994. Induction of structural changes in the BPV-1 origin of replication by the viral E1 and E2 proteins. *Proceedings of the National Academy of Science USA,* 91:8846-50.

ABSTRACT

James A. Borowiec was born in Buffalo, New York, in 1958, the youngest of four children. His father was a union lawyer, interested in local politics, and his mother was a housewife. His extended family, of Polish descent, lived also in the "Polish neighborhood" where they celebrated holidays and family events together. While still a child, Borowiec and his family moved to Atlanta, Georgia, where Borowiec had a Catholic education through high school. Although he says now that science was not well taught, he was interested in science from an early age.

Borowiec received his B.S. in Organic Chemistry from the Georgia Institute of Technology in 1980. While there he worked in a chemistry lab during the school year. During one summer he worked for the U.S. Forest Service in Elko, Nevada. He matriculated into the Department of Chemistry and Biochemistry at UCLA, where he received his Ph.D. in 1986. At UCLA he also met and married Dianne Applegate, a fellow scientist.

Borowiec did a rotation in Paul D. Boyer's laboratory, at the Molecular Biology Institute, and then in Jay D. Gralla's laboratory. He worked on DNA supercoiling; *lac*; and footprinting technique. After receiving his Ph.D. he obtained a post-doc in the Department of Molecular Biology at Memorial Sloan-Kettering Cancer Center in New York City. There he worked in Jerard Hurwitz's lab, studying SV40 per se and as a model of human DNA replication. In 1989 he was appointed assistant professor in the Department of Biochemistry at New York University Medical Center in New York City. His work continues there, encompassing over the years an interest in replication of linear DNA; flaws in C. Richard Wobbe's discovery of SSB DNA; T-antigen; ARS; and particularly bovine papillomavirus. Borowiec and his wife, Dianne, who works in her lab at Mount Sinai School of Medicine, and his 2-1/2-year-old son, Zachary, live in Greenwich Village, where they attempt to balance the demands of scientific research and publication with the demands of family life.

Borowiec has received several grants, including a post-doc and a grant from the NIH and a Pew Scholars Program grant. He has published many articles on a number of subjects; the articles appear in many different journals, including *JMB*, *Biochemistry*, *Cell*, and *PNAS*.

UCLA INTERVIEW HISTORY

INTERVIEWER:

Neil D. Hathaway, Interviewer, UCLA Oral History Program. B.A.., English and History, Georgetown University; M.A. and C. Phil., History, UCLA

TIME AND SETTING OF INTERVIEW:

Place: Borowiec's office, New York University Medical Center.

Dates, length of sessions: September 14, 1993 (81 minutes); September 17, 1993 (58); September 23, 1993 (123); October 1, 1993 (85); October 9, 1993 (84); October 10, 1993 (128).

Total number of recorded hours: 9.3

Persons present during interview: Borowiec and Hathaway.

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, from 1988 through 1992.

In preparing for this interview, Hathaway, in consultation with the director of the UCLA Oral History Program and three UCLA faculty project consultants, developed a topic outline to provide an overall interview framework. Hathaway then held a telephone preinterview conversation with Borowiec to obtain extensive written background information (curriculum vitae, copies of published articles, etc.) and agree on a research and interviewing timetable.

Hathaway further reviewed the documentation in Borowiec'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, Hathaway consulted such works as: J.D. Watson et al., *The Molecular Biology of the Gene.* 4th ed. 2 vols. Menlo Park, CA: Benjamin/Cummings, 1987; Lubert Stryer, *Biochemistry.* 3d ed. New York: W.H. Freeman, 1988; *The Journal of the History of Biology;* H.F. Judson, *The Eighth Day of Creation: Makers of the Revolution in Biology.* New York: Simon and Schuster, 1979; and recent issues of *Science, Nature,* and *Cell.*

The interview is organized chronologically, beginning with Borowiec's childhood and education in Buffalo and Atlanta and continuing with his education at Georgia Institute of Technology and UCLA, his postdoc at Memorial Sloan-Kettering Cancer Center, and his academic career at New York University Medical Center. Major topics discussed include

DNA structure, simian virus 40 replication, T antigen, bovine papillomavirus, replication forks, and trends in science funding and publishing.

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.

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

Steven J. Novak, senior editor, prepared the table of contents and interview history.

Jayanti compiled the biographical summary and index.

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