

CHEMICAL HERITAGE FOUNDATION

**MICHAEL D. COLE**

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview  
Conducted by

Robert Kohler and Naomi Morrisette

at

Princeton University  
Princeton, New Jersey

on

1 August 1989

(With Subsequent Corrections and Additions)

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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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## MICHAEL D. COLE

1951 Born in Lima, Ohio on August 27

### Education

1973 B.A., Physics, Ohio Northern University

1978 Ph.D., Biophysics, The Johns Hopkins University

### Professional Experience

1978-1980 The Johns Hopkins University, Baltimore, Maryland  
Post-Doctorate, Biology

1980-1984 St. Louis University School of Medicine, St. Louis, Missouri  
Assistant Professor of Biochemistry

1984-present Princeton University, Princeton, New Jersey  
Assistant Professor of Molecular Biology

### Honors

1978-1980 Leukemia Society Postdoctoral Fellowship

1984-1988 American Cancer Society Faculty Research Award

1985 Pew Scholars Award

## ABSTRACT

Michael D. Cole grew up in Ada, Ohio, the oldest of four children. His father was an insurance agent, his mother a housewife. He was always interested in science and nature. He was good at math and physics in high school, so he majored in physics at Ohio Northern University, never taking a biology class. Nonetheless, he found biology more attractive as a career so he entered a PhD program at Johns Hopkins University, starting in Michael Beer's lab. His thesis involved trying to sequence DNA using microscopy. As a postdoc in Ru Chih Huang's lab, Cole planned to study immunoglobulin but ended up working to characterize the *myc* gene instead.

Cole took his first job at St. Louis University, where he used the tumor systems in a "survey" experiment with *myc*. He found the translocation and translocation breakpoint, publishing results in *Cell* that were considered a major breakthrough in the study of cancer. He moved to Princeton University, where there was a good molecular biology department headed by Arnold Levine. He has stayed with *myc* since, still seeking the binding site, but he has two other related areas of interest: finding cofactors necessary for activating tumor growth and studying growth factor receptors.

Cole talks about his personal philosophy; his style; his belief in the necessity for intellectual curiosity in science; serendipity; funding difficulties, especially for long-term projects like his; the problem of invasiveness of tumors. He hopes that in five years he will have found the binding site for *myc*. He wants to study the biology of the system in order to find out *how* transformation of cells occurs, but at this point he feels that the technology does not permit it; he will be going to Sweden to try using PCR. Cole concludes the interview with a discussion of the prints and postcards decorating his office.

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Early Years	1
<p>Grew up in Ada, Ohio. Father insurance agent, mother housewife. Oldest of four children. Always interested in science. Collected turtles. Religion. Good at math and physics in high school. Attended Ohio Northern University, home-town college; took no biology or chemistry classes.</p>	
Graduate School Years	4
<p>More interested in biology for career; choosing biophysics programs. Johns Hopkins gave best offer. Tutorial with Daniel Butler piqued interest in genetics. Started in Michael Beer's lab. Defining biophysics. Wife medical technician at Johns Hopkins. Divorce. Thesis involved using microscopy to sequence DNA. Good relationship with Beer. Project not very successful.</p>	
Postdoc Years	10
<p>Molecular biology still small field. Wanted to do gene regulation. Worked in Ru Chih Huang's lab. Tried to clone immunoglobulin, but cloned contaminant, mouse retrovirus. Got immunoglobulin later, also by accident, expressed in tumor cells. Others working on immunoglobulin: Susumu Tonegawa, Leroy Hood, Philip Leder.</p>	
St. Louis University Years	13
<p>Simian virus 40 paper by Daniel Nathans and Hamilton Smith got him interested in cell transformation. Used postdoc tumor systems in assay from Robert Weinberg paper. Couldn't identify any gene by doing transfection in plasmacytoma DNA. Paper by William Hayward finally persuaded to try "survey" experiment with <i>myc</i>; successful. Still with <i>myc</i>. Found translocation and translocation break point; published in <i>Cell</i>. <i>Ras</i> oncogene mutation mapped; publicity for major cancer breakthrough. Beat other, larger labs; Leder's lab had found but not recognized. Larger labs do more experiments but not more successful per person. Most contributions by talented people going to best schools and labs. St. Louis and Wake Forest his best job offers. Hopkins' biochemistry department heavily "German"; Wisconsin chemistry. Department considered molecular biology a fad, not real biology; cloning genetics, not biology. Molecular biology done in medical school and at Carnegie Institution. Biochemistry also got more publicity. Likes teaching. Style hard to define: "bounces around." Frustration because no conceptual way to go from protein to binding site, but easy to go other way. Now trying PCR to find site.</p>	
From St. Louis University to Princeton University	24
<p>Wanted to be in East. Accepted offer from Princeton University. Arnold Levine chair of department; good molecular biology. Prefers not being in medical school. Lab size now smaller. <i>Myc</i> hard. Loner style. Side areas of interest: what else besides <i>myc</i> involved for transformation; also growth factor receptors. Structural biology interesting but does not tell how cell is transformed. Invasiveness. Traditional dogma: <i>myc</i> immortalizes, <i>ras</i> transforms; his lab reverses. Hopes in five years to have found</p>	

binding site for *myc*. Wants to study biology of system; at this point technology does not permit. Funding and long-term projects.

#### Personal Philosophy and General Thoughts

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Independent. Does not like to do what others are doing. Proud of first paper; thorough mapping. *Myc* paper also very good, though less publicity garnered. Competition: labs of David Baltimore, Harold Varmus, Philip Sharp. Serendipity important in science. Cdc2 protein latest “hot” topic. Overselling. Need for intellectual curiosity. Always liked to put together things or to analyze. Still works at bench. Sweden. PCR on *myc* to find binding site. Discussion of artists’ prints in office.

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