

Leading Polymer Chemist and DNA Researcher at UCSD Dies

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Kim McDonald

Bruno H. Zimm, an emeritus professor of chemistry and biochemistry at the University of California, San Diego and one of the world's leading polymer chemists and DNA researchers, died on November 26 at UCSD's Thornton Hospital in La Jolla. He died from pneumonia following a long battle with Parkinson's disease. He was 85.

Zimm was one of six scientific luminaries lured from renowned East Coast and Midwestern institutions to establish UCSD's celebrated chemistry department, joining the faculty in 1960 as a professor of chemistry. Most of his work at UCSD focused on understanding the fundamental physical and chemical properties of DNA. His discoveries about how DNA could be physically measured and how to estimate the propensity of this molecule to fold into helical structures provided some of the basic tools that made possible the current revolution in genomics.

"It was one thing for Watson and Crick to develop the basic model for the structure of DNA," said Russell Doolittle, an emeritus professor of chemistry and biology at UCSD who was one of Zimm's close colleagues. "It was quite another thing to know how this molecule behaved in the real world. That was Bruno's contribution."

Born on a mountainside in Woodstock, New York on October 31, 1920, Zimm had a childhood rich in the arts. His father, Bruno Louis Zimm, was a famous American sculptor and his mother, Louise, was a writer.

"He grew up in a world of art and he learned how to work with his hands," said Doolittle. "I think this upbringing really had a bearing on how he worked as a scientist. He was the only biochemist on the campus, for instance, who had a lathe in his laboratory."

Zimm's ability to conceive and construct new kinds of scientific tools was legendary. In the late 1960s, he and his students built what was called an elastic viscometer. This instrument was used to estimate the size of DNA molecules by stretching the coiled-spring-like molecules in solution with a paddle and measuring how long it took them to return to their fully coiled state. Zimm determined that the time it took for the molecules to recoil into their original states could provide an estimate of the size of these tiny microscopic threads.

In 1973, he and UCSD biologist Ruth Kavenoff used this technique to measure for the first time the size of a DNA molecule in an intact fruit fly chromosome, an achievement that conclusively showed that each chromosome was composed of a single densely folded DNA molecule.

Zimm was equally talented in his development of new theoretical models. Another of his major achievements was his development in 1948 of the Zimm plot, which explains the propensity of DNA, proteins and other molecules to fold, twist and coil in solution. Remarkably, it is still used and cited in papers by chemists today.

For his scientific achievements, Zimm, who was elected to the prestigious National Academy of Sciences at the young age of 38, was awarded in 1981 the academy's Award in the Chemical Sciences. The award is given "for innovative research in the chemical sciences that in the broadest sense contributes to a better understanding of the natural sciences and to the benefit of humanity."

Zimm was also a member of the American Academy of Arts and Sciences, received the 1960 Bingham Medal of the Society of Rheology and the 1963 American Physical Society High-Polymer Physics Prize.

He received his bachelor's degree in chemistry from Columbia University in 1941 and Ph.D. degree in chemistry from Columbia in 1944. He taught briefly at the Polytechnic Institute of Brooklyn, joined the chemistry faculty at UC Berkeley for four years, was a visiting lecturer at Harvard University, then spent nine years as a researcher at the General Electric Research Laboratory in Schenectady, NY, before coming to UCSD. He became an emeritus professor at UCSD in 1991, but maintained a presence on campus until 2002.

Despite his many achievements and honors in science, which included issues of scientific journals prepared specifically in his honor, Zimm was extraordinarily modest, according to friends, and his interests outside of science were diverse-sailing, playing the clarinet, reciting limericks.

"This was not a man enslaved by professional ambitions," said Doolittle. "He pondered the world and how it worked. And he was universally liked and respected."

Zimm is survived by his spouse, Georgianna Zimm, of La Jolla, a research biologist at UCSD, and two sons, Louis Zimm of San Diego, a ship captain, and Carl Zimm, a physicist in Madison, Wisconsin. A memorial gathering for Bruno Zimm will be held on the UCSD campus on December 13th from 2 to 4 p.m. at the Center for Molecular Genetics.

Directions to campus and a link to a campus map are available online at <http://www.cmg.ucsd.edu/Directions.shtml> The Center for Molecular Genetics is building #805 on the map, located at position D/E, 10.

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