



David B. Wilson

January 15, 1940 – April 29, 2017

David B. Wilson, Ph.D., joined the Cornell faculty in 1967 and served 50 years. He received his bachelor's degree from Harvard University in 1961 and completed his doctorate at Stanford University in 1966, both in biochemistry, and did postdoctoral research at Johns Hopkins University. He was a pioneer in the study of cellulases, which are enzymes from bacteria, fungi and plants that have evolved to decompose cellulose, the principal structural component of plant cell walls and the most abundant polymer in the biosphere. Cellulases break down cellulose so it can be converted into sugars, a critical step for making biofuels.

“David was a true biochemist who was devoted to understanding how the world might derive clean fuels from plants,” said Linda Nicholson, professor of molecular biology and genetics. “He was a world leader in this area, and was immensely generous with his time and knowledge. He was a wonderful colleague who will be tremendously missed.”

Wilson hailed from a family of distinguished scientists. His father was renowned chemist Edgar Bright Wilson, considered a father of microwave spectroscopy and co-author with Nobel laureate Linus Pauling of the seminal textbook “Introduction to Quantum Mechanics.” His brother was the late Cornell physicist Kenneth G. Wilson, who won the Nobel Prize in physics in 1982.

While at Cornell, Wilson was a member of the fields of molecular biology and genetics, microbiology and toxicology, where he took part in many interdisciplinary collaborations. Wilson used a combination of genomics, protein engineering, structural biology and molecular biology to develop detailed mechanisms to explain how cellulases and related proteins work to break down cellulose.

“He was a brilliant scientist and a very generous colleague who was always interested in other people’s ideas,” said John Brady, professor of food science, who collaborated with Wilson by combining molecular modeling of cellulases and genetic engineering techniques to slightly alter amino acids in cellulases to make them work faster and more efficiently. “It’s a great loss to the university and to the field of enzymology.”

Wilson’s research on cellulases began in the 1980s and initially involved investigations into the basic biochemical principles for how these enzymes work. In the 1990s his work took on a more applied importance because of the growing interest in using biofuels as renewable energy sources. Researchers have been working to efficiently break down cellulose from waste biological materials such as the leaves and stalks from corn or wood chips from lumber sawmills into sugars, which can then be fermented into alcohol for biofuels. He focused on understanding the diversity of these enzymes in nature, the key reaction mechanisms used by them to hydrolyze crystalline cellulose, and how they interacted synergistically to yield much higher rates of hydrolysis than one would expect from their individual activities. David also pioneered the use of molecular biology methods to produce clones that yielded large quantities of a particular cellulase, and he used protein engineering methods such as directed evolution to understand and manipulate bases and acids in the enzymes’ catalytic sites.

During his career, he authored or co-authored over 200 papers. In 1999, Wilson co-founded with Ed Bayer of the Weizmann Institute the highly successful biennial Gordon Research Conference on Cellulases and Cellulosomes. He served as Chairman, Key Note Speaker, and Session Chairman of this conference, which celebrated its 10th meeting in 2017. Wilson was known to organize long walks with the Gordon Conferences participants that often led to insightful scientific discussions on exploring global sustainability challenges while taking in the beautiful nature.

Wilson also worked in the field of toxicology, especially early in his career, where he focused on developing new bioremediation technologies, including systems for concentrating, removing and recycling heavy metal contaminants such as mercury in soils and water with genetically engineered bacteria in bioreactors. He served as director of the Cornell’s Institute for Comparative and Environmental Toxicology from 1997 to 2005. He also directed the Biotechnology Program Fermentation Facility from 1990 to 2005.

Wilson taught courses in biochemistry and molecular biology, including Biosynthesis of Macromolecules, which he co-taught for many years with colleague Jeffrey Roberts, and sat on graduate committees of students in biochemistry and microbiology.

“He was always very patient in the lab with everybody,” said Maxim Kostylev, Ph.D. ’13, a postdoctoral researcher in microbiology at the University of Washington and former graduate student under Wilson. “Anytime I was stuck with my experiments, when things weren’t going well, I’d start a conversation with him, and that always made me feel much better.”

“He has received much recognition for his work, including election to major scientific organizations, being asked to run major meetings in his field and prestigious journal editorships,

most recently at the Journal of Biological Chemistry and Applied Environmental Microbiology,” said Eric Alani, professor and former chair of the Department of Molecular Biology and Genetics.

Wilson received honors from the Johns Hopkins University Society of Scholars (1990) and the American Academy of Microbiology (2003). Locally, Wilson served as chairman of the board of directors at Cayuga Medical Center in Ithaca from 1994 to 1999, and he also was a lifelong sports fan and a coach of youth sports teams when his daughters were young.

Wilson is survived by his wife, Nancy, three daughters, two sisters and two brothers.

*Written by Eric Alani, Larry Walker, and John Brady
This statement was modified from an article written by Krishna Ramanujan published on May 5,
2017 in the Cornell Chronicle.*