Last Modified: Wednesday, 11-Feb-2009 14:33:15 EST

In Memoriam: Frederic M. Richards

The following message was sent by Yale School of Medicine Dean Robert J. Alpern.

In Memoriam: Frederic M. Richards, Ph.D. Protein Structure Pioneer
August 19, 1925-January 11, 2009

Dr. Frederic M. Richards, a structural biologist at Yale and an innovative leader in the study of the relationships between protein structures and their biological functions, died at home on January 11. Sterling Professor of Molecular Biophysics and Biochemistry at Yale, Richards was instrumental in the development of molecular biophysics and structural biology at Yale and nationwide.

Dr. Richards died of natural causes at the age of 83.

Fred Richards' most paradigm-shifting experiment, published in 1958, showed that two separate, inactive fragments of the enzyme RNaseA could be reconstituted to form an active enzyme. This provided the first experimental evidence that the ability of a protein peptide to form a three dimensional structure is an intrinsic property of its amino acid sequence. This result anticipated the discovery that the unfolded whole RNaseA protein could be refolded within a test tube to form an active enzyme. "That finding merited an award of the Nobel Prize to Christian Anfinsen in 1972, a prize Richards could arguably have shared," according to Richards' colleague Yale Sterling Professor Thomas A. Steitz. In the 1960s Richards teamed up with faculty colleague Dr. Harold Wyckoff to establish in 1967 the atomic structure of ribonuclease S, which was only the third protein structure established.

A characteristic of Richards' most seminal discoveries was that he often obtained them pursuing an approach that was orthogonal to the general direction of the field and often executed them himself. While on sabbatical in Oxford in 1968, Richards constructed a large device employing a half-silvered mirror that allowed building an atomic model of a protein into an experimentally obtained density map. Due perhaps to its unusual construction it was initially known as "Fred's folly," but after it was adapted for use by the structural biology community worldwide it became respectfully known as "The Richards optical comparator." Richards also developed computational methods for understanding the nature, stability and function of proteins from knowledge of their atomic structures. These included calculating their surface areas, which can be used to analyze the interactions between proteins, and to compute the tightness of the packing density of a protein. The latter was published as a single author paper, completed while he was also chair of the department.

In the periods of 1963-67 and 1969-73, as chair of a newly merged Department of Molecular Biophysics and Biochemistry at Yale, Fred Richards brought together and initiated the development of one of the major centers in the world for the study of biophysics and structural biology. He developed a department of biophysics that included and worked in concert with the newly emerging field of molecular biology.

Fred Richards was born in Connecticut and obtained his Ph.D. at Harvard in 1952, after which he pursued postdoctoral research at the Carlsberg laboratory in Copenhagen, Denmark, and at Cambridge University in England. In 1955, he joined the faculty of the Biochemistry Department at Yale University and in 1963 at the request of Yale President Kingman Brewster, took on the task of merging the departments of Biochemistry and Biophysics to form the Department of Molecular Biophysics and Biochemistry with a mandate to move the department in the direction of the new field of molecular biology.

Richards was a member of the National Academy of Sciences, the American Academy of Arts and Sciences as well as American Philosophical Society. Fred Richards took on many tasks to serve the community at large including being Director of the Jane Coffin Childs Memorial Fund for Medical Research (1976-91) which awards postdoctoral fellowships. He was awarded the Connecticut Medal of Science in 1995.

Dr. Fred Richards is survived by his wife Sarah W. Richards, three children, Sarah O. Richards, Ruth G. Richards and George H. Richards and their spouses (Rick Blank, Lee Blackwell and Sally B. Richards, respectively), as well as four grandchildren.

Last Modified: Wednesday, 11-Feb-2009 14:33:15 EST
