Takashi Yonetani, PSOM

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Takashi Yonetani

Takashi Yonetani, emeritus professor of biochemistry and biophysics at the Perelman School of Medicine who was on the standing faculty at Penn for 55 years, died April 13. He was 89.

Dr. Yonetani was renowned as a scientist and a leader in the biochemical and biophysical study of redox proteins, particularly hemoglobin.

Dr. Yonetani earned a BS in biology and his PhD in biochemistry from Osaka University in Japan in 1953 and 1960, respectively. He came to the University of Pennsylvania in 1958 as a predoctoral fellow to work with Britton Chance, director of the Johnson Foundation. Dr. Yonetani spent his postdoctoral period with Nobel Prize–winning scientist Hugo Theorell at the Karolinska Institutet in Sweden.

In 1964, Penn recruited Dr. Yonetani to serve as an assistant professor of physical biochemistry. He remained at Penn the rest of his career, becoming an associate and then full professor of physical biochemistry. He served a year as acting chair of the new department of biochemistry and biophysics when it was founded in 1975.

Dr. Yonetani's earliest work dealt with the enzymatic mechanism of alcohol dehydrogenase. He went on to the study heme enzymes and transporters, which held his passion throughout his career. He was widely respected as the leading expert in isolation and purification of heme proteins. Although he was red/green color-blind and could not see the colors of the proteins that he worked with, he was able to visually assess the state of the protein during purification. He crystallized cytochrome c oxidase and cytochrome c peroxidase, technical feats that ultimately led to elucidation of their structures. He extensively studied oxygen binding and release in normal and variant hemoglobin and pioneered the use of substituting other metals for iron in the heme proteins.

Dr. Yonetani specialized in various spectroscopic techniques and made numerous discoveries in the field of mechanism of redox proteins. Most notably, he determined the nature and structure of numerous redox reaction intermediates as well as identifying an entropic allosteric mechanism of allostery in hemoglobin in which protein dynamics plays crucial roles in cooperativity. He received numerous awards and served as a visiting professor and promoted collaborations in training and research at institutions worldwide.

According to Kristen Lynch, Benjamin Rush Professor and chair of the department of biochemistry and biophysics, "He was generous with his time in teaching medical and graduate students and in collaboration with his colleagues." He retired in 2019.

Dr. Yonetani is survived by his daughter, Ann (Zachary Perlman); and grandsons, Taiyo and Nikko.