

**MEMORIAL RESOLUTION OF THE FACULTY
OF THE UNIVERSITY OF WISCONSIN-MADISON**

ON THE DEATH OF PROFESSOR EMERITUS HIROSHI SUGIYAMA

Professor Hiroshi Sugiyama passed away on Sunday, September 4, 2005. Known as Sugi to many friends and colleagues, he was born in 1916 in Alameda, California. In June 1934, he graduated from Alameda High School as the “head student” and thus was awarded the honor of presenting the commencement address. Sugi earned his B.A. in Bacteriology from the University of California, Berkeley in 1939. He then worked as a bacteriologist for the county of San Luis Obispo, California where he received both the California Department of Health certification for general public health laboratory work and the California Department of Agriculture certification for bacteriology laboratory procedures.

In January 1942, Sugi was drafted into the Army and served for 44 months as the noncommissioned officer in charge of the medical laboratory at Fort Leonard Wood, MO, supervising a staff of 30. He received his honorable discharge in February 1946. He continued his work as a laboratory technician until the fall of 1946 when he entered the Ph.D. program in the Department of Bacteriology at the University of Chicago under the GI Bill. He graduated with his Ph.D. in 1950 under the mentorship of Dr. Gail Dack. His thesis was entitled: “Studies on Factors Affecting the Heat Resistance of Spores of *Clostridium botulinum*.”

Upon graduation, Sugi accepted a faculty position at the University of Chicago’s newly created Food Research Institute (FRI) and was promoted to associate professor in 1961. In 1966, the Food Research Institute moved to the University of Wisconsin-Madison under the direction of Dr. E.M. Foster, professor of bacteriology. While maintaining a joint appointment with the Department of Bacteriology and the Food Research Institute, Sugi rose to the level of full professor. He mentored several Ph.D. and M.S. students, some of whom went on to high-level positions in academia, private industry and government both in the United States and abroad, including China, Korea and Japan. In 1989, Sugi became professor emeritus and continued to co-author publications for another seven years.

While at FRI in Chicago, Sugi worked on the microbiology of staphylococcal enterotoxins. At the UW, he assumed primary responsibility for the botulism research at FRI and the Department of Bacteriology and established a long and distinguished career. Sugi and his lab were pioneers in botulinum neurotoxin research, including its purification and biochemistry, and discovering its dichain structure and mode of activation. He was among the first investigators to show that some strains of *C. botulinum* produce more than one serotype of neurotoxin, and he characterized botulinal-like neurotoxins from *C. baratii* and *C. butyricum*. Sugi developed many practical procedures that have helped investigators in the botulism field, including effective methods for purification, toxicity assays and methods to raise high quality antibodies to the toxins in animals. He continued his work on *C. botulinum* and its neurotoxins until his retirement.

Besides his contributions to the basic science of *C. botulinum*, Sugi made several very important discoveries in food safety and public health. Sugi demonstrated the potential hazard associated with the common practice of packaging fresh mushrooms wrapped in plastic film. This created an excellent anaerobic environment in which *C. botulinum* spores could germinate and produce toxin. This research led to packaging changes in which one or two holes were placed in the plastic film. Take note of this the next time you are in your favorite grocery store! In the 1970s, Sugi’s laboratory investigated the accepted practice of restaurants to simply store their unused foil-wrapped baked potatoes at room temperatures until they were reheated when needed. Sugi demonstrated the hazards of this practice by showing that in these tightly wrapped potatoes, botulinum spores were capable of surviving the baking process, germinating and producing toxin while the potatoes remained at ambient temperatures. This practice, too, was stopped.

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Sugi's laboratory also was the first to demonstrate the unique and previously unrecognized pathogenesis of human infant botulism. His laboratory developed several animal models showing the role of the indigenous intestinal microflora in the toxicoinfection of human infant botulism. In infant botulism, ingested spores actually germinate within the intestinal tract and produce lethal levels of toxin. Infants are susceptible to this spore germination because inhibitory species of bacteria are still absent from their immature intestinal microflora. Research with animal models also predicted that an adult counterpart of infant botulism was possible following a disruption of their normal intestinal microbial flora—a prediction that unfortunately was subsequently proven correct. Dr. Sugiyama's laboratory also identified honey as the source of *C. botulinum* spores for some cases of infant botulism, which led to the recommendation by the American Academy of Pediatrics that honey not be fed to infants less than one year of age.

Dr. Sugiyama had many interests outside of the laboratory. He enjoyed his annual family vacations, which almost always involved camping and fishing. He was an avid fisherman and enjoyed bait fishing on Wisconsin lakes and fly fishing in the Rocky Mountains, especially at his favorite sites near Yellowstone National Park and in the Steamboat Springs region in Colorado. He became highly skilled at making his own flies. He enjoyed classical music, reading, word (crossword and acrostic) puzzles and both flower and vegetable, especially tomato, gardening. He is survived by his wife, Yuri, and his two daughters Linda and Gayle, both of whom completed their Ph.D. degrees.

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