

Daniel Wang, Institute Professor and pioneer in biochemical engineering, dies at 84

Longtime MIT professor launched the Biotechnology Process Engineering Center and influenced generations of students.

Anne Trafton | MIT News Office
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Daniel I.C. Wang, an MIT Institute Professor, was considered one of the founding fathers of the field of biochemical engineering.

Image: Stu Rosner

Daniel I.C. Wang, an MIT Institute Professor who was considered one of the founding fathers of the field of biochemical engineering, died Saturday in Cambridge, Massachusetts. He was 84.

During his long career at MIT, Wang contributed to many aspects of biochemical engineering — a field that involves genetically engineering microbes and human cells to produce useful proteins. His research spanned all phases of the process, including fermentation, monitoring and control of bioprocesses, enzyme technology, product purification, and protein folding.

In 1985, Wang was the driving force behind the launch of MIT's Biotechnology Process Engineering Center (BPEC), which was founded as a multidisciplinary research center bringing together faculty from the departments of Biology, Chemistry, and Chemical Engineering.

“Danny’s work and impact in the field of biochemical engineering were profound, and led to a major shift in the growth of chemical engineering at the interface with biology,” says Paula T. Hammond, the David H. Koch Professor and head of the MIT Department of Chemical Engineering. “He extended chemical engineering concepts to bioreactors and the first efforts in bioprocesses, enzyme technology, and mammalian cell cultures, among many other accomplishments. Chemical engineering has lost a giant, and the department has lost a good friend and incredible mentor to our faculty, researchers, and numerous alumni.”

The establishment of MIT’s BPEC coincided with the overall emergence of biotechnology as an industry and a research field. Wang and other early pioneers developed ways to use emerging knowledge about the genetics of microbes to engineer them to produce useful products. Among many other projects, Wang worked on engineering *E. coli* to increase their production of desired recombinant proteins. He also studied techniques for increasing yields of therapeutic recombinant

proteins and monoclonal antibodies from mammalian cells.

He also worked closely with the biotechnology industry and was one of the original members of Biogen's scientific board, where he was instrumental in the company's development of the manufacturing of complex biopharmaceuticals.

Born in Nanking, China, Wang worked to establish international ties between MIT and universities in other countries, particularly in Asia. He established a joint program in molecular engineering of biological and chemical systems with the National University of Singapore, which became part of the Singapore-MIT Alliance for Research and Technology (SMART).

Wang, who served as the Chevron Professor of Chemical Engineering before being named an Institute Professor, was also known for his dedication to his students. Noubar Afeyan, a former student of Wang's who is now the CEO of Flagship Pioneering and a member of the MIT Corporation,

described him as a friend and cherished mentor.

“Danny touched thousands all over the world by inspiring generations of students, industrial collaborators, and fellow professors. He was confident yet humble, tough yet caring, serious yet playful, with an insatiable appetite for good Chinese food. We will miss Danny and work hard to make his legacy proud,” Afeyan says.

In recognition of Wang’s pioneering research, MIT’s Frontiers of Biotechnology Lectureship was renamed for him in 2014. Now known as the Daniel I.C. Wang Lecture, the lectureship honors achievements at the frontiers of biotechnology, and the distinguished scientists and engineers responsible for them.

“Dan Wang’s influence as a teacher, mentor, researcher, and friend has been monumental to so many people who have become the leaders in building a biotech industry and biochemical engineering as a profession,” says Charles Cooney, the Robert T. Haslam Professor of Chemical

Engineering at MIT. “Though saddened by his passing, we celebrate his legacy of unwavering nurturing of students and colleagues to address challenging problems with innovative solutions.”

Wang earned two degrees from MIT — a BS in 1959 and an MS in 1961. In 1963, he earned a PhD in chemical engineering from the University of Pennsylvania. He joined the MIT faculty in 1965 and was named an Institute Professor, MIT’s highest faculty honor, in 1995. He received numerous honors and awards, including the Amgen Biochemical Engineering Award in 1995 and the William H. Walker Award from the American Institute of Chemical Engineers in 1994. He was also a member both of the National Academy of Engineering and the American Academy of Arts and Sciences.

In 2019, the American Institute of Chemical Engineers established an award in his honor — the D.I.C. Wang Award for Excellence in Biochemical Engineering. The award is given annually and “recognizes individuals for their contributions to the

field and to the practice of biochemical engineering through their position in industry or academia as exemplified by Professor Wang in his 50 years of contributions,” according to the AIChE.

Wang also contributed to national efforts in biotechnology, as chair of the Membership Committee of the National Academy of Engineering, a member of the National Biotechnology Policy Board at the National Institute of Health, a member of the National Research Council Committee on Bioprocess Engineering, a member of the National Research Council Committee on Biotechnology, and a member of the Board of Biology of the National Research Council.

He also co-authored five books, published more than 250 papers, and was awarded 15 patents.

Wang is survived by his wife, Victoria; his son, Keith; his daughter-in-law Katherine; his two granddaughters, Veronica and Emily; his sister, Judy, and her family; and his sister-in-law, Cecile. Plans for a memorial will be announced at a later

date.