

Y.C. 'BERT' FUNG • 1919-2019

# U.C. SAN DIEGO RESEARCHER WAS CALLED 'FATHER OF BIOMECHANICS'

BY GARY ROBBINS

UC San Diego researcher Y.C. "Bert" Fung, who blended biology, medicine and engineering into a field that has given rise to everything from heart valves to wireless health monitors to automobile crash bags, died on Sunday, the university said. He was 100.

Fung, the so-called "father of biomechanics," passed away of natural causes at UC San Diego's Jacobs Medical Center, his family said.



Scholars described him as a seminal figure in 20th century science who got his contemporaries to think of human health in more precise and practical ways by combining medicine with the principles and rigors of engineering and biology — "bioengineering," for short.

"When you went to the doctor 50 years ago the treatment usually involved drugs because scientists mainly thought of the human body in terms of chemistry," said Shu Chien, a UC San Diego bioengineer who was recruited by Fung.

"But we breathe, which is mechanical. Our heart pumps blood, which is mechanical. So is our digestive system. You also need to think about biology and engineering."

Fung got scientists to do it, especially as it applies to the mechanics of blood flow, leading others to invent an array of lifesaving valves and cardiac assist devices.

"It happened against all odds," said Geert Schmid-Schonbein, a UC San Diego

bioengineer. "He joined the faculty in 1968, before bioengineering had become an academic discipline on university campuses. The textbooks in the field had yet to be written. The courses had yet to be created.

"People would say to him, 'You're not a biologist. And you're not an engineer. What are you?'"

Fung was actually well-grounded in both of those fields, and he would soon write the textbooks and create the courses that would help establish bioengineering as an important discipline.

His collective contributions were considered to be so important he was awarded the National Medal of Science in 2000. Fung was the first bioengineer to earn that honor.

Scholars say Fung also succeeded because he was a remarkably resilient person — a characteristic that appears to have developed during a difficult childhood in China.

Yuan-Cheng Fung was born on Sept. 15, 1919, in Changzhou, a part of Jiangsu Province. His father was an educator and a respected painter, and his mother was a housewife. Y.C. Fung had six siblings.

In the fall of 1931, Japan invaded Manchuria, setting off armed conflict. That led to mandatory military training in local schools, a harrowing disruption that Fung survived.

He went on to earn a bachelor's and a master's degree from National Central University. Then, in 1946, he traveled to the U.S. and enrolled at Caltech, where he excelled in aeronautics.

That might have been his life's work if his mother had not develop glaucoma.

Historians say he devoted all of his energy to helping her and was frustrated to learn that comparatively little was known about the physical and mechanical forces that affect living tissue.

"I turned to bioengineering, with a focus on people, because I felt that although we know so much about airplanes, we don't know much about ourselves," Fung said during a talk he gave in 2007, campus officials say.

Fung ended up leaving Caltech for UC San Diego, partly because it has a medical school, and partly because it was a new university where people could explore cutting-edge ideas with a lot of campus support.

"He published one landmark paper after another, helping define bioengineering," Chien said.

Fung also became known as an extraordinary teacher.

"I was an undergraduate in chemical engineering who took a class from him because I needed a technical elective," said Ghassan Kassad, president of the California Medical Innovations Institute in Sorrento Valley.

"Without any notes in hand, he went to the chalkboard and starting writing equations about how blood flows through arteries and how the heart contracts. And he did it in a poetic way. I remember being mesmerized. I soon changed my major to bioengineering," he said.

Fung is survived by his son, Conrad, and Conrad's two sons, Anthony and Michael, and by his daughter, Brenda Fung, and her son, Nicholas Manos, and Manos' wife, Claire.

gary.robbs@sduiontribune.com