



## MURRAY B. SACHS

1940–2018

Elected in 2002

*“For contributions to the understanding of the neural encoding and signal processing of complex sounds, and for leadership in bioengineering education.”*

BY JENNIFER H. ELISSEEFF

**M**MURRAY B. SACHS, a guiding figure in the field of biomedical engineering and former professor at Johns Hopkins University, died March 3, 2018, at the age of 77.

He was born in St. Louis, Missouri, on September 3, 1940, and grew up in University City, the son of a lawyer who left legal practice to start a woodworking factory. Murray received his undergraduate (1962) and graduate degrees (1964, 1966) in electrical engineering from the Massachusetts Institute of Technology. During his graduate work, he turned his attention to studying the brain, working with the noted auditory neuroscientists Nelson Kiang, William Peake, and Tom Weiss. His postdoctoral research extended to visual neuroscience at the University of Cambridge. He returned stateside in 1969 to serve in the Navy and joined the Naval Underwater Sound Laboratory, working on submarine communication.

In 1970 Dr. Sachs became an assistant professor of biomedical engineering at Johns Hopkins University, where he spent his scientific career, rising to the rank of professor. His scientific research broke new ground about the way the brain receives and processes information about sound. With colleagues, he developed methods for estimating the responses of large populations of auditory neurons to sounds and applied the methods to show how information about human

speech is represented in the brain. This revolutionary research allowed scientists to understand the global picture of sound representation—as opposed to methods that focused on single neurons studied one by one—and provided a basis for designing and improving hearing aids.

As director of the Department of Biomedical Engineering (1991–2007) he more than doubled the size of the faculty and spearheaded the funding and design of a new building to accommodate the growth. He advanced the boundaries of biomedical engineering into new scientific areas to leverage tremendous developments in basic biological science, in areas such as genetics, cellular communication and organization, and medical imaging. The department's reputation as one of the best in the world derives in large part from Dr. Sachs' leadership during this period of growth.

The importance of his scientific work is matched by his organizational and leadership accomplishments. He initiated and led the Johns Hopkins Center for Hearing and Balance, which brought together researchers from biological, medical, and engineering departments to collaborate on these sensory systems. The center flourished under his leadership and remains a major internationally recognized research group.

Murray was committed to his students and to mentoring. This focus gave rise to leading researchers and academics across the country, some of whom went on to chair major BME departments. In the laboratory, he was warm and supportive while conveying the rigor and excitement of high-quality scientific inquiry. He encouraged his students to think independently and to advance their work in unanticipated directions, helping them to expand the boundaries of their thinking—which explains why many of his students now work in scientific disciplines remote from their thesis work.

Dr. Sachs' research accomplishments were recognized by prestigious honors, including the 1999 Award of Merit of the Association for Research in Otolaryngology, the 1998 von Békésy Medal of the Acoustical Society of America for "contributions to understanding the neural representation of complex acoustic stimuli," and election to both the Institute

of Medicine (now the National Academy of Medicine; 1990) and National Academy of Engineering (2002). He served the National Academies as a member of the Committee on Hearing, Bioacoustics, and Biomechanics (1985–88) and membership section and nominating committees.

During college, Murray met his future wife, Merle Diener, in St. Louis and traveled to see her during school breaks. They married in 1968 and moved to Baltimore in 1970. His beloved Merle preceded him in death by 3 weeks.

Murray was an avid sailor who loved captaining his boat *The Gratitude* in the Chesapeake Bay and sailing with his friends in Casco Bay, Maine. He was a runner who completed the Maryland and New York marathons. He also was a life-long baseball fan—he came to adore the Orioles and avidly followed the Colts and Ravens.

Murray loved being a grandfather and spending time with his grandchildren. He is survived by his sons Benjamin and his wife Lisa, Jonathan and his wife Kate, and six grandchildren.