

BIOENGINEERING

PRESENTS

Acoustic tweezer and its biomedical Applications



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ABSTRACT:

Acoustic tweezer, the counter part of optical tweezer in acoustics, was developed more than 10 years later than optical tweezer. It has been found to be capable of performing many tasks similar to optical tweezer but substantial differences also exist. Because of its larger wavelength, acoustic tweezer manipulates larger particles and yields larger forces in the nanonewton range. A number of biomedical applications have been studied including measuring intercellular forces and cellular mechanical properties. These results along with its physical principles will be reviewed in this paper.

BIOGRAPHY:

K. Kirk Shung obtained a B.S. in EE from Cheng Kung University, Taiwan in 1968 and a Ph.D. in EE from University of Washington, Seattle, WA, in 1975. He has been a professor of biomedical engineering at USC since 2002. He was a dean's professor in biomedical engineering at the Viterbi School of Engineering of USC from 2013-2018 and became the Dwight C. and Hildagarde E. Baum Chair of Biomedical Engineering in 2018.

Dr. Shung is a life fellow of IEEE, and a fellow of American Institute of Ultrasound in Medicine. He is a founding fellow of American Institute of Medical and Biological Engineering. He received the IEEE Engineering in Medicine and Biology Society Early Career Award in 1985 and was the coauthor of a paper that received the best paper award for IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control (UFFC) in 2000. He was elected an outstanding alumnus of Cheng-Kung University in Taiwan in 2001. He was selected as the distinguished lecturer for the IEEE UFFC society for 2002-2003. He received the Holmes Pioneer Award in Basic Science from American Institute of Ultrasound in Medicine in 2010. He received the academic career achievement award from the IEEE Engineering in Medicine and Biology Society in 2011 and IEEE Biomedical Engineering Award in 2016. Dr. Shung has published more than 500 papers and book chapters. He has written two textbooks. He is an associate editor of IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control, IEEE Transactions on Biomedical Engineering and Medical Physics. Dr. Shung's research interest is in ultrasonic transducers, high frequency ultrasonic imaging and applications in cellular bioengineering.