USC Viterbi
School of Engineering
Department of Biomedical Engineering

How Cochlear Biomechanics Tunes Mammalian Hearing

Friday, January 12, 2018
2:00pm-4:00pm Room DRB 145

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The exquisite sensitivity and frequency discrimination of mammalian hearing derive from forces generated by outer hair cells (OHCs) within the auditory portion of the inner ear, the cochlea. These forces amplify the sound-induced vibrations within the tissues of the cochlea to enhance quiet sounds and sharpen frequency tuning. Our group has pioneered the technique of using optical coherence tomography to measure sound-induced vibrations within the mammalian cochlea without opening the bone that surrounds it, thus minimizing artifacts. Furthermore, we study transgenic mice with targeted mutations that affect different biomechanical aspects of the cochlea to localize the underlying processes necessary for normal hearing. The goal of this work is to understand the fundamental biomechanical changes that underlie progressive hearing loss and to develop treatments to overcome them.

Dr. Oghalai is the Tiber Albert Professor and Chair of the USC Caruso Department of Otolaryngology – Head and Neck Surgery since August 2017. Oghalai was a professor in the Department of Otolaryngology – Head & Neck Surgery at Stanford University School of Medicine since 2010. He was also director of the Stanford Children's Hearing Center, held joint academic appointments in the departments of neurosurgery and pediatrics at Stanford, and served as the director of the Clinician-Scientist Training Program in Otolaryngology – Head and Neck Surgery at Stanford. As a clinician-scientist, Oghalai feels strongly that the mission of an academic department in a research medical school is to work toward development of innovative procedures and strategies that improve patient care. His current research includes a prospective clinical trial in pediatric cochlear implant recipients, translational research in imaging of the cochlea and of the auditory cortex in human subjects, and basic science research in the fundamental mechanisms of cochlear physiology.

*This event is co-sponsored by the Biomedical Engineering department and the Ming Hsieh Institute.