FIU Biomedical Engineering
FLORIDA INTERNATIONAL UNIVERSITY

Biomedical Engineering
Wallace H. Coulter Foundation
Lecture Series

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"Neuroengineering Approaches for Novel Therapies to Treat Hearing Loss and Deafness"

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Lecture: 9:00 AM-10:00 AM
ENGINEERING CENTER
ROOM EC 2300
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MIAMI, FL 33174

Abstract: The long-term goal is to ameliorate the debilitating consequences of age-related hearing loss (ARHL) or presbycusis; and other types of hearing impairment and deafness. Specifically, ARHL is the number one communication disorder and top neurodegenerative condition of our expanding aging population. The vast majority of people over age 60 are affected by this progressive decline in auditory sensitivity and difficulty understanding speech in noisy environments. While ARHL is one of the top three chronic medical conditions of the elderly, there currently are no FDA-approved biomedical treatments for preventing or reversing permanent hearing loss (ARHL or other types). Despite decades of research and discovery, overcoming the barriers of hearing loss and deafness through prevention and treatment continues to represent a major scientific and clinical challenge. The thematic research focus is a prevention or modulation of hearing loss through biotherapeutics and targeted drug delivery or neural stimulation. An important feature of these approaches is the combination of biomedical engineering techniques with neuroscience and molecular biology paradigms. This pioneering research uses innovative catalysts to prevent or treat hearing loss. Insights gained from transdisciplinary approaches will play a prominent role in guiding development of new technological and biomedical therapies aimed at slowing or preventing the occurrence of age-related, noise induced and other types of hearing loss or deafness.

Biography : Dr. Robert D. Frisina received his Ph.D. in Bioengineering and Neuroscience from Syracuse University's College of Engineering. He pursued postdoctoral research as an NIH Fellow in Sensory Physiology and Biophysics at the University of Rochester (NY) Medical School. He is currently Professor and BME Director in the Chemical & Biomedical Engineering Dept. at the University of South Florida's (USF- Tampa) College of Engineering. He also serves as Director of USF's intercollegiate research center: The Global Center for Hearing & Speech Research. Previously, he was Professor of Otolaryngology, Neurobiology & Anatomy, and Biomedical Engineering, and Associate Chair of Otolaryngology at the University of Rochester Medical School for 2 decades. Dr. Frisina's main research support is currently a Program Project Grant from the National Institutes for Health - NIH, entitled "The Aging Auditory System: Presbycusis and Its Neural Bases"; as well as two other NIH R01 grants on areas related to drug delivery and acquired hearing loss. Research program goals include developing improved diagnoses and therapeutic interventions for deafness and age-related hearing and balance problems using biomedical engineering techniques and implantable devices. A systems analysis approach is taken to understanding neurophysiological processing at different levels of the auditory system. Major themes of these lines of neuroengineering research are aimed at developing novel therapies for diagnosing, preventing, delaying or treating cases of environmentally or hormone-induced hearing loss, and age-related hearing deficits. In addition, a newer project involves stimulating nerve and heart cells with laser light and gold nanoparticles.