FIU Biomedical Engineering
FLORIDA INTERNATIONAL UNIVERSITY

Biomedical Engineering
Wallace H. Coulter Foundation
Lecture Series

WALLACE H. COULTER Foundation

"Exploring thermal sensitivity of the inner ear for basic science & therapeutic Applications"

Dr. Suhrud Rajguru
Assistant Professor
Department of Biomedical Eng. & Otolaryngology
University of Miami

Friday, October 14th , 2016
Lecture: 9:00 AM-10:00 AM
ENGINEERING CENTER
ROOM EC 2300
10555 WEST FLAGLER STREET
MIAMI, FL 33174

Abstract: That temperature is an important parameter and influences inner ear responses has been long known. In this seminar, I will present results from studies focused on manipulating the thermal sensitivity of inner ear sensory cells that investigate molecular mechanisms of infrared neural stimulation, study the role of intracellular Calcium and develop therapeutic applications. We have utilized endogenous sensitivity of pulsed infrared neural stimulation to stimulate inner ear neurons. The results provide significant new information about infrared neuronal excitability and functional role of key intracellular stores. The precise photocontrol of intracellular organelles and signaling pathways with the possibility to excite or inhibit individual neuron activity could provide high impact applications in neuroscience. Furthermore, our results examining infrared evoked vestibular eye movement and vestibulosympathetic reflex responses *in vivo* suggest new therapeutic applications of infrared optical stimuli. In a separate study, we have found that localized hypothermia applied to the cochlea during cochlear implant electrode insertion provides significant protection from functional loss caused by insertion trauma without the negative effects observed from systemic hypothermia. This approach has significant translational potential given the recent technological developments that require long-term preservation of a patient's residual hearing and sensitive neural structures post-implantation. I will discuss our results and ongoing studies of the molecular pathways and gene networks significant for otoprotection to understand the benefits of hypothermia and improve its translation to clinical practice

Biography :Suhrud M. Rajguru is an Assistant Professor of Biomedical Engineering and Otolaryngology and Director of the Sensory Electrophysiology Laboratory, part of the University of Miami Ear Institute. Dr. Rajguru earned his doctoral degree in Bioengineering at the University of Utah. Prior to joining the faculty at University of Miami in the Departments of Biomedical Engineering and Otolaryngology, he was a postdoctoral trainee at Washington University in Saint Louis and at Northwestern University in Chicago. His primary research interests are in the fields of auditory and vestibular neurophysiology. NIH-funded ongoing research projects in his laboratory focus on the development of optical stimulation tools for applications in basic science, auditory and vestibular neural prostheses, and therapeutic interventions. In collaboration with Cochlear Limited and funded by the NIH, he is also developing applications of therapeutic hypothermia for conservation of hearing and neural function against electrode-induced trauma. His research highlights the success of collaborative efforts between the Departments of Otolaryngology and Biomedical Engineering to address and develop technologies to improve human health. He is a member of the Association for Research in Otolaryngology, Society for Neuroscience, Biomedical Engineering Society and Biophysical Society.