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## Department of Biomedical Sciences

presents a seminar

# “Neural network mediating the phantom sound of tinnitus and loudness hypersensitivity (hyperacusis)”

**Prof. Richard Salvi, Ph.D., Director  
Center for Hearing & Deafness  
University at Buffalo  
Buffalo, NY, USA**

**Date : 10 July 2017**

**Time: 11:00am to 12:30pm**

**Venue: Meeting Room 2-130, 1/F, Block 2, To Yuen Building**

### Abstract

Hearing loss is often accompanied by two debilitating disorders, tinnitus, a phantom ringing sensation and hyperacusis, a condition in which every day sounds are perceived as intolerably loud or painful. Since tinnitus and hyperacusis are triggered by cochlear damage, these disorders were assumed to originate in the ear. However, since cutting the auditory nerve failed to eliminate these symptoms, tinnitus and hyperacusis are now believed to arise from aberrant neural activity somewhere within the central nervous system. To identify the neural substrate for these disorders, we induced tinnitus and hyperacusis with salicylate, an ototoxic drug and used behavioral, electrophysiological and fMRI techniques to identify the elements of tinnitus-hyperacusis network. Salicylate depressed the neural output of the cochlea, but vigorously amplified sound-evoked neural responses in the amygdala, inferior colliculus, medial geniculate body and auditory cortex. Resting-state fMRI revealed hyperactivity within a neural network consisting of the inferior colliculus, medial geniculate body and auditory cortex with side branches linked to the cerebellum, amygdala and reticular formation. Functional connectivity fMRI analysis revealed enhanced coupling within the auditory network and between parts of the auditory network and the cerebellum, reticular formation, amygdala and hippocampus. The components of this new network can account for the distress, spatial location, arousal and gating of tinnitus and hyperacusis.

### About the Speaker

Richard Salvi is a SUNY Distinguished Professor in the Department of Communicative Disorders and Sciences at the University at Buffalo and the Director for the Center for Hearing and Deafness. Salvi received his Ph.D. in Experimental Psychology from Syracuse University and later completed a Post-Doc in Auditory Neuroscience at the Upstate Medical Center in Syracuse. He has served on numerous national and international grant review panels and serves on the editorial boards of more than a dozen journals. He has published more than 450 scientific papers, research reports and books related to the noise-induced hearing loss, tinnitus, hyperacusis, ototoxicity, brain imaging and age-related hearing loss.

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**All are welcome !**