Stephenson School of Biomedical Engineering Seminar Series
Presents

Molecular Modification of Mesenchymal Stem Cells for Translational Inner Ear Research

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Friday, November 18, 2016
1:30 P.M.
Devon Energy Hall, Room 120

Hinrich Staecker, MD, PhD trained at Albert Einstein College of Medicine and Massachusetts Eye and Ear infirmary. His clinical practice at the University of Kansas School of Medicine focuses on otology and neurotology, specifically cochlear implantation, auditory brain stem implants and acoustic neuroma surgery. His research projects are aimed at improving the treatment of sensorineural hearing loss using both molecular therapeutics and devices. Current projects include developing drug delivery for inner ear disease and developing gene therapy for the treatment of inner ear disease.

Currently his lab is evaluating the effect of different vector constructs on cochlear and vestibular function and evaluating the efficacy of atoh1 gene transfer for the regeneration of vestibular function. He is the principal investigator in the first in man hair cell regeneration gene therapy trial and multiple trials focusing on inner ear drug delivery. He is a member of the Triological Society, the American Otological Society and the Collegium Oto-Rhino-Laryngologicum.

The discovery of stem cells has revolutionized biology and translational research in many fields. Within the inner ear, residual populations of stem cells that can form a variety of cell types have been documented. Additionally, stem cell technology has been used to functionally replace spiral ganglion cells in an animal model. Within other areas of medicine, stem cell technology is being actively developed for applications as diverse as organ replacement and modulation of systemic immunological reactions. For the immediate future, use of embryonic stem cells is limited due to ethical concerns. Forced transformation of somatic cells into stem cells risks malignant transformation of transplanted cells. Mesenchymal stem cells offer the potential of a safe, ethically non-controversial pool of cells which can be applied to translational inner ear research. Manipulation of the cells ex vivo using standard gene therapy techniques can further expand the utility of these cells. We will discuss the use of mesenchymal stem cells in developing pools of human inner ear cells for drug testing, the use of bone marrow derived cells to modulate the impact of cochlear implant trauma and the utilization of stem cells with ex vivo gene therapy to delivery neurotrophins to the inner ear.

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