

## SUMMER RESEARCH at Oregon Health & Science University

The Dept. of Otolaryngology/Head & Neck Surgery, and the Oregon Hearing Research Center is offering three 3-month NIH summer research fellowships to medical students for Summer of 2006. Each research fellowship carries a monthly stipend of \$1730. One will start approx. June 1, and two from July 1, 2006.

Successful students will work with a faculty member to develop a research project to be conducted during the summer months with the aim of a published article, a (inter)national conference presentation or both. Research projects currently in progress are:

### ***Auto-immune disease and otitis media in the inner ear:***

Causes and treatment of otologic autoimmune disease, and otitis media. For more info contact Dennis Trune Ph.D. at [truned@ohsu.edu](mailto:truned@ohsu.edu).

### ***Pharmacokinetics of ototoxic drugs:***

Identification of mechanisms of ototoxic drug entry into the inner ear that induce sensory cell death. For more info contact Peter Steyger Ph.D. at [steygerp@ohsu.edu](mailto:steygerp@ohsu.edu).

### ***Hair-cell transduction***

Our goal is to figure out how inner-ear hair cells convert the information in mechanical stimuli (like sound and head movements) into electrical signals that the brain can interpret. We are identifying the molecules and how they interact to make a sensitive mechano-transduction apparatus. We use molecular biology, electrophysiology, imaging, biochemistry, genetics, and mathematical modeling. For more info contact Peter Gillespie Ph.D. at [gillespp@ohsu.edu](mailto:gillespp@ohsu.edu).

### ***Invertebrate mechanosensory transduction***

We are investigating mechanosensation in *Drosophila*, employing genetic, physiological, molecular and cell biological tools to address the role of molecules in sensory neurons. For more info contact Richard Walker Ph.D. at [walkerri@ohsu.edu](mailto:walkerri@ohsu.edu).

### ***Otoacoustic emissions***

Electrophysiological examination of cochlear mechanics and oto-acoustic emissions. For more info contact Tianying Ren M.D. at [rent@ohsu.edu](mailto:rent@ohsu.edu).

### ***Cochlear blood flow and mechanisms of sound induced oxidative damage to the cochlea***

Studies on the regulation of inner ear blood flow and the influence of sound as an agent that can induce ischemia and metabolic overload in the cochlea. Studies on the pathways of oxidative damage to the sensory cells and blood vessels in the cochlea. For more info contact Alfred Nuttall Ph.D. at [nuttall@ohsu.edu](mailto:nuttall@ohsu.edu).

### ***Neurohumoral regulation of inner ear artery: cellular electrophysiology.***

Characterizing ion channels, receptors and signal transduction pathways in inner ear artery cells and their responses to nerve stimulation and vasoactive agents. For more info contact Zhi-Gen Jiang M.D. at [jiangz@ohsu.edu](mailto:jiangz@ohsu.edu).

### ***Effects of estrogen on olfactory neurons***

Investigation into the effects of estrogen on the developing peripheral olfactory system using immunohistochemical and molecular techniques. For more info contact Karen Fong, MD at [fongka@ohsu.edu](mailto:fongka@ohsu.edu)

### ***Gene therapy in tissue engineering***

In a rat calvarial model, we are examining bone reconstruction using a plasmid gene therapy vector. Various substrates such as VEGF, EGF are being tested. For more info contact Mark K. Wax, M.D. at [waxm@ohsu.edu](mailto:waxm@ohsu.edu).

### ***Mechanisms and treatment of chronic tinnitus***

Using data from patients treated in the Tinnitus Clinic, we are investigating different mechanisms of tinnitus, and evaluating the effectiveness of various treatments (medication, acoustic therapy, and psychological counseling). For more info contact Bob Folmer Ph.D. at [folmerr@ohsu.edu](mailto:folmerr@ohsu.edu).

### ***Molecular mechanisms of tumor invasion during epithelial carcinogenesis***

We are studying molecular mechanisms of tumor invasion, utilizing transgenic/knockout mice, using molecular and cell biological techniques and in vivo experiments. For more info contact Xiao-Jing Wang MD/PhD at [wangxiao@ohsu.edu](mailto:wangxiao@ohsu.edu).

### ***Cell fate specification in the vertebrate inner ear.***

Determination of cell lineage relationships in the mouse inner ear using ultrasound backscatter microscopy, experimental embryology, virology and molecular biology. For more info contact John Brigande, Ph.D. at [brigande@ohsu.edu](mailto:brigande@ohsu.edu).

### ***Genetic screening of inner ear mutations in zebrafish***

We are taking a genetic approach using zebrafish to try to identify the molecules required for mechanotransduction in sensory hair cells, and to understand human deafness. For more info contact Teresa Nicolson Ph.D. at [nicolson@ohsu.edu](mailto:nicolson@ohsu.edu).

Interested students should identify a mentor and with whom they should develop a brief research plan (2 paragraphs) for submission, along with a resume and a short statement the importance of a research internship to their career goals (by email only) to Peter Steyger ([steygerp@ohsu.edu](mailto:steygerp@ohsu.edu)) by **March 31st, 2006**.

Peter Steyger, Ph.D.

<http://www.ohsu.edu/ent/gen/sum.html>