

# DRF 2008-2009 Grant Recipients Announced

**T**he Deafness Research Foundation (DRF) is pleased to announce that it has awarded 18 grants of up to \$25,000 each to highly-qualified research scientists in the field of hearing and balance science. These funds will be used to support scientific research in the following five areas:

- Fundamental auditory research in development, genetics, molecular biology, physiology, anatomy and animal models;
- Hearing and balance restoration for infants, children and adults, including cochlear implants, surgical therapy for otosclerosis, hair cell regeneration, hearing aids and medical therapy;
- Hearing loss caused by aging, noise, otosclerosis, viral infection (sudden deafness), ototoxicity, temporal bone pathology, otitis media, cholesteatoma and tumors;
- Vestibular and balance disorders (dizziness and vertigo, Meniere's disease);
- Tinnitus (ringing in the ears) and hyperacusis (decreased tolerance of sound).

Over the past 50 years, DRF has been the leading source of private funding for research in hearing and balance science and has awarded nearly \$24 million through more than 2,200 research grants to scientific researchers. This seed money has led to dramatic innovations that promise to increase options for those living with hearing loss, as well as protect those at risk.

Applications were received from renowned scientists from top research institutions around the United States and were reviewed by DRF's Council of Scientific Trustees. With a stringent competitive process, the Council selected the proposals of the following talented researchers.

## First Year DRF Grant Recipients



**R. Michael Burger, Ph.D., Lehigh University** Burger received his Ph.D. from the University of Texas and his postdoctoral training at the University of Washington Medical School and the University of Munich.

He has recently established his own laboratory at Lehigh University.

**Sound Localization Processing** Burger's research centers on the question of how cellular, synaptic and systems level properties are integrated to allow sensory neurons to extract and represent features of the acoustic environment. Results should contribute to the continued improvement of auditory

prosthetic devices and understanding auditory diseases that are linked to dysfunction in neural circuitry.

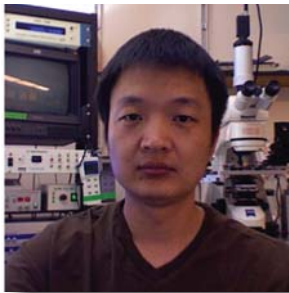


**Snezana Levic, Ph.D., University of California, Davis** Levic received her B.A. in mathematics and biochemistry/molecular biology in 1999 from the University of California,

Davis, and her Ph.D. in neuroscience in 2006 from Mills College.

**Hair Cell Development and Regeneration** Levic's study will increase our understanding of the activity-dependent development in the auditory system. Furthermore, this study

will deepen our understanding of the role of the peripheral hair cells, which are located in the inner ear and are the primary transducers of sound to the central nervous system. This study may also contribute to the treatment of hearing disorders whose pathology lies within the developing hair cells.



**Geng-Lin Li, Ph.D., Oregon Health & Science University** Li received his Ph.D. in neurobiology in 2003 from Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences. He

then moved to the Vollum Institute, Oregon Health & Science University in Portland, Ore., where he works as a postdoctoral fellow.

**Auditory Signal Coding at the Hair Cell Ribbon Synapses** In the cochlea, auditory information is coded in series of electrical pulses, which are sent to the brain via thousands of auditory nerve fibers. Li's research investigates the mechanisms underlying this coding and the strategies employed by it. His work could point to better hearing experiences for patients with cochlear implants.



**Kathleen McNerney, Ph.D., CCC-A, State University of New York at Buffalo** McNerney received her Ph.D. from the State University of New York at Buffalo in 2007 and is currently working there

as a postdoctoral fellow. She is also employed in a private practice as a clinical audiologist.

**Vestibular Evoked Myogenic Potential – Unanswered Questions** Although the vestibular evoked myogenic potential (VEMP) is a response from the vestibular system, it is elicited in response to loud sounds. McNerney's research will evaluate the effects of different types of stimuli on the

VEMP and the relationship between them, as well as the differences in the VEMP when presenting stimuli to one ear versus both ears.



**Christian N. Paxton, Ph.D., University of Utah** Paxton received his M.S. from Brigham Young University in 2000 and his Ph.D. from Iowa State University in 2006, where his research focused on gene regula-

tion during heart development. He transitioned to hearing research two years ago when he began his post doctorate.

**The Role of Fgf4 in Otic Placode Induction** Development and patterning of the inner ear is a complex process that involves many signals from several different protein families. One such protein family that helps to signal the start of ear development is the fibroblast growth factor family. This project will investigate the role of the protein Fgf4 in the early stages of inner ear development.



**Iris Schrijver, M.D., Stanford University of Medicine** Schrijver received her M.D. at the University of Utrecht in the Netherlands, and completed a postdoctoral research fellowship at Stanford University.

She is a diplomat of the American Board of Medical Genetics and holds specialty certification in Clinical Molecular Genetics.

**The Functional Impact of Single and Dual Expression of GJB2 Missense Variants V271 and E114G** Schrijver focuses on nerve-based hearing loss and the impact of using molecular biology techniques of hearing impairment in developing improved patient management options. Changes in hearing loss-associated genes range from having no functional consequence, to clearly disease-causing mutations. She is investigating whether the combined presence of the variants of the genes V271 and E114G can contribute to

hearing loss.



**Yu-chi Shen, Ph.D., University of Michigan** Shen earned her master's degree in immunology in Taiwan and her Ph.D. at the University of Michigan. She is a postdoctorate in the Department of Cell and

Developmental Biology of the University of Michigan.

**The Role of MIF in Zebrafish Inner Ear Development**

This study will help determine how to preserve auditory system neurons, in order to regenerate a functional reconnection to the inner ear's sensory hair cells or to augment the efficacy of a cochlear implant.



**Chin-Tuan Tan, Ph.D., New York University, School of Medicine** Tan received his B.E., M.E. and Ph.D. degrees in electrical and electronic engineering from Nanyang Technological University (Singapore) in 1992, 1996 and

2000, respectively. He is currently an associate research scientist in the Department of Otolaryngology at New York University School of Medicine, and adjunct associate professor in the Department of Electrical and Computer Engineering at the Polytechnic Institute of New York University (formerly Polytechnic University).

**Nonlinearly Distorted Music and Speech as Perceived by Hearing-Impaired People** Hearing aids and other communication devices, such as telephones, introduce significant nonlinear distortion which reduces sound quality. The proposed research is to characterize and model the perception of distorted speech and music by hearing-impaired listeners in order to determine how hearing-impaired listeners evaluate the perceived quality of distorted speech and music.

**Kathleen T. Yee, Ph.D., Tufts University School of**



**Medicine** Yee received her B.A. at the University of California at Berkeley and her Ph.D. at the University of Cambridge, England, and The Salk Institute for Biological Studies, San Diego, Calif. She currently is

a research assistant professor at Tufts University School of Medicine.

**A Role for Pax6 in Cochlear Nucleus Development**

The Pax6, a molecule that binds to DNA and controls the activity of other genes, has long been known to affect eye development, often causing aniridia, type II (AN2) in humans. Yee's data demonstrates Pax6 gene expression in the cochlear nucleus. This proposal will examine the extent of anatomical changes in the cochlear nucleus of people with AN2 and how these changes potentially affect hearing.

## Second Year DRF Grant Recipients



**Tamara Alliston, Ph.D., University of California, San Francisco** Alliston completed her undergraduate work at Trinity University in San Antonio, Texas, and graduate work at the Baylor College of

Medicine in Houston. She is an assistant professor in the Department of Orthopaedic Surgery at the University of California, San Francisco.

**Cochlear Capsule Bone Remodeling in Hearing Loss**

Alliston recently started her independent laboratory in the Department of Orthopaedic Surgery where she and her team are working to identify pathways that can be targeted to im-

prove the quality of bone throughout the skeleton, particularly in the ear where bony abnormalities cause hearing loss.



**Mirna Mustapha-Chaib, Ph.D., University of Michigan**

Mustapha-Chaib obtained her Ph.D. in human genetics from the Department of Genetics of Sensory Defects at the Pasteur Institute of Paris

in collaboration with the Department of Medical Genetics at Saint Joseph University of Beirut, Lebanon. Mustapha-Chaib is currently a research investigator in the Human Genetics Department at the University of Michigan.

**The Functional Role of the Amino Terminus of Myo15 in Hearing**

Deafness is a common birth defect, affecting about 1 birth in 2000. About half of these children are affected because of genetic reasons and there is no known cure or prevention. Mutations in the gene Myosin 15 cause congenital, permanent deafness in humans and mice. Mustapha-Chaib seeks to produce a mouse model to identify the pathological changes caused by human mutations. The mouse model could be used in the future to test therapeutic interventions that might improve hearing after birth.



**Irina Calin-Jageman, Ph.D., University of Illinois**

Calin-Jageman received her Ph.D. in biology at Wayne State University in Detroit. She became interested in hereditary

deafness during her postdoctoral training at Emory University. She is currently a research assistant professor in the Department of Anatomy and Cell Biology at the University of Illinois at Chicago.

**Harmonin Interactions with Voltage-Gated Ca<sup>2+</sup> Channels in a Mouse Model of Usher Syndrome**

Calin-Jageman will apply her cellular and molecular training to understand the specific mechanisms that are involved in

how the genes that impact deafness work. Specifically, she is interested in Usher syndrome, a condition that can affect hearing, balance and vision.



**Patricia Loomis, Ph.D., Rosalind Franklin University of Medicine and Science**

Loomis received her B.S. in genetic engineering technology from Cedar Crest College, Allentown, Pa., and her Ph.D. from the Department

of Cell Biology, University of Alabama at Birmingham. She has been a research associate at Northwestern University in Chicago and Rosalind Franklin University of Medicine and Science where she is currently serving as research assistant professor.

**Splicing Regulation of Pre-mRNA Generated From the Deafness-Associated Espin Gene**

Loomis' research is focused on the espins, a family of proteins which have been implicated in deafness in humans. Particularly, the goal is to determine how this family of proteins is generated from one gene. Furthermore, studies will seek to determine how the espins are created and their specific biological roles within the inner ear.



**Ania Majewska, Ph.D., University of Rochester**

Majewska started her Ph.D. at Stanford University where she studied chemistry and biology and became interested in synapses and cortical networks.

She finished her Ph.D. at Columbia University and did her postdoctoral work at Massachusetts Institute of Technology. In 2005 she joined the faculty at the University of Rochester.

**Cortical Synaptic Plasticity in a Mouse Model of Moderate Sensorineural Hearing Loss**

Hearing can be increasingly restored through the use of hearing aids and peripheral devices but it is unclear whether the brain centers that usually process sound are ready to function

normally in the presence of restored hearing. Majewska's work will evaluate changes in cortical networks that occur in developmental hearing loss to aid in the design of future treatments for hearing loss.



**Sonja Pyott, Ph.D., University of North Carolina at Wilmington**

Pyott received her B.S. in biochemistry and molecular biology from Penn State University in 1999 and her Ph.D. in neuroscience from

Stanford University in 2006. She is currently a research assistant professor at the University of North Carolina at Wilmington.

**Enhancement of the Efferent-Hair Cell Synapse** Pyott studies how sensory hair cells in the cochlea, the mammalian hearing organ, are regulated by neurotransmitter receptors and ion channels. These sensory cells provide a unique system to relate the contributions of single molecules to the physiology of the cell and the hearing organism.



**Valeriy Shafiro, Ph.D., Rush University**

Shafiro received a B.A. with honors in psychology from New York University and a Ph.D. in speech and hearing sciences from the City University of New York. He

is an assistant professor of audiology in the Department of Communication Disorders and Sciences at Rush University Medical Center in Chicago.

**Perception of Environmental Sounds and Speech in Patients with Cochlear Implants** Shafiro's current research examines whether environmental sound and speech perception of cochlear implant users can improve following a period of short-term environmental sound training.

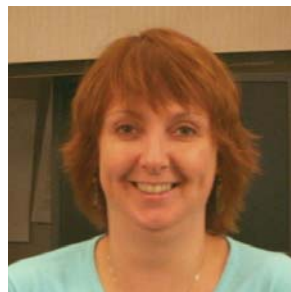


**Lisa Urness, Ph.D., University of Utah**

Urness earned her Ph.D. in 1995 and is currently a postdoctoral research associate studying embryonic ear development in the laboratory of Dr. Suzanne

Mansour at the University of Utah.

**FGF-Regulated Hearing Loss Genes** Urness is studying the genes that have a role in ear development. These studies will ultimately contribute to our understanding of the genetic "blueprint" for "building an ear." Moreover, it is anticipated that many of these genes may be implicated in congenital hearing or balance disorders and that their discovery may suggest potential therapeutic interventions.



**Ilse Wambacq, Ph.D., Montclair State University**

Wambacq received her Ph.D. in communication sciences and disorders from the University of Texas at Dallas. She is interested in the study of brain activation

patterns in response to binaural input in adults with and without sensorineural hearing loss. In addition, she is interested in the study of speech perception in adverse listening situations in multilingual populations.

**Neurophysiological and Psychoacoustic Indices of Binaural Processing** This study will provide information necessary to assess binaural processing and to develop remediation strategies for individuals with sensorineural hearing loss. ■