

# Neuroaudiology Newsletter

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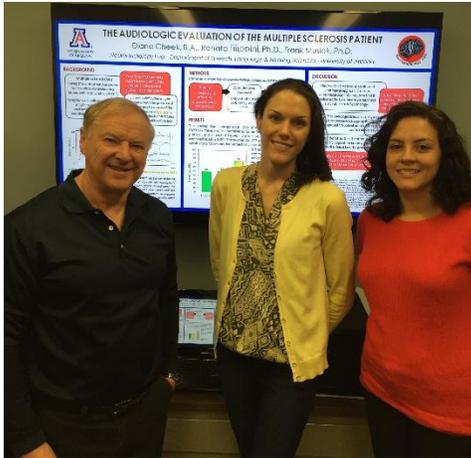
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*Happy One Year Anniversary of Our Newsletter!*

## Poster Presentation Awards

This year we have multiple students that are receiving awards for their submissions to the spring 2016 conferences. These students from The University of Arizona and The University of

Connecticut have been working hard with **Dr. Frank Musiek** on their projects to achieve these honors. The following people should be recognized:



**Diane Cheek, B.A. and Renata Filippini, Ph.D.** (pictured with Frank Musiek from left to right) received the **NIH Mentored Student Research Poster Award** from the American Auditory Society (AAS) conference and the **Poster Presentation Scholarship Award** from the Academy Research Conference (ARC) for their work on audiologic evaluation of the Multiple Sclerosis patient.

**Barrett St. George, B.A. and Andrew DeMarco, M.S.** received the **Poster Presentation Scholarship Award** from ARC for their work on the unusual morphology of the posterior Sylvian Fissure.

**Julianne Ceruti** working with her dissertation committee (**Drs. Musiek, Cienkowski, Bernstein,**

### *Did you know?....*

- The contraction of Lyme Disease has been shown to be correlated with auditory processing deficits?
- Somatosensory integration occurs throughout the central auditory system even as caudal as the cochlear nucleus?

**Palmer, and Weihing**) at the University of Connecticut received the **NIH Mentored Student Research Poster Award** from the AAS conference for their work on behavioral and electrophysiological measures of partially filled gap detection performance.

**Jennifer Gonzalez** working with her dissertation committee (**Drs. Musiek, Cienkowski, Bertstein, Baran, and Oliver**) at the University of Connecticut received the **NIH Mentored Student Research Poster Award** from the AAS conference for her work on the onset-offset N1-P2-evoked response in individuals with high-frequency sensorineural hearing loss.

## Historical Vignettes-Hallowell Davis



*Hallowell Davis*

Hallowell Davis, born in 1896, was a renowned neurophysiologist who made major contributions that expanded the field of audiology. He received his A.B. from Harvard in 1918 and his M.D. from Harvard Medical School in 1922. He went on to complete his post-doc in electrophysiology at the University of Cambridge under E.D. Adrian. Davis returned to his Alma mater and taught for 24 years as an associate professor in the physiology department. In 1947 he accepted a position at the Central Institute for the Deaf in St. Louis as director of research. He was also appointed to professor of physiology and research professor of otolaryngology at the Washington University Medical School. At around the same time, Davis authored and edited a book, *Hearing and Deafness*, which chronicled his extensive work in hearing science, cochlear anatomy, and rehabilitation. This was the first time that the term “Audiology” was defined as a discipline. His book served as an invaluable learning tool for future clinicians. Davis also held a multitude of other positions, such as president of the Acoustical Society of America and The American Physiological Society.

His background in electrophysiology led to pioneering studies that examined the auditory pathway from the cochlea to the cortex. This included analyzing electrical cochlear potentials, in which he differentiated Wever-Bray’s cochlear hair cell microphonic from the auditory nerve response action potential. Davis also correlated single neuron responses to a limited band of frequencies delivered to the ear. In his later work, Davis along with collaborators, mapped the space-time distribution of stimulus frequency in the cochlea; discovered summing potentials and invented a method for compounding action potentials. Davis helped develop electroencephalography (EEG) and was one of the first in the US to record his own brain waves. He translated the use of EEG to a clinical setting and utilized evoked potentials to test hearing in difficult populations, such as infants. Davis’s fundamental research paved the way for advances in neurophysiology and audiology. He was awarded the National Medal of Science in 1966 for his work.

### LADS-Lectures in Auditory Disorders

The Neuroaudiology Lab will host the 2nd annual Lectures in Auditory Disorders and Sciences (LADS) seminar on April 19<sup>th</sup> from 6:30-7:30 PM at The University of Arizona. This exciting lecture will feature a prominent researcher in the field of audiology, Robert Sweetow, Ph.D. The topic he will be presenting on is: *Tinnitus Patient Management: What you need to know now, and what you will need to know when you’re in practice*. We are very excited for this presentation and invite all to come!

#### Did you know?....

-The dichotic rhyme test is essentially not influenced by the focus of attention to one ear or the other. Unlike most other dichotic tests.

## Interview with Robert Sweetow



Robert Sweetow (pictured left) is a clinical professor in the Otolaryngology Department at The University of California, San Francisco. We had the opportunity to have a Q and A with Dr. Sweetow regarding research topics and his interests in tinnitus.

### **Do you have any tips for maintaining a work-life balance when it comes to being a researcher?**

I never really looked at myself primarily as a researcher. Primarily I saw myself as a clinician, secondary as researcher, and third as an administrator. With regards to tips for maintaining a work-life balance, I was not very good at it at first, but at some point in time you are going to stop working and you will need to rely on your family and friends, so you need to maintain this balance. It's important to make your family and friends understand that if you're going to have a research career (as opposed to a traditional 9-5 job, which is also perfectly acceptable) that there are going to be times in the evenings and weekends that you come home late. There will also be times that you are home at a regular time but you are sitting and thinking about ideas and will need to break just to write it down. You also need to be honest with your family and make some time void of any work obligations. Put aside some time that you are available in advance. This time should be an absolutely sacred time to spend with family and friends without work.

### **For somebody planning on going into hearing science research, what do you see as the value or drawbacks of first obtaining a clinical degree?**

First, I think there is a real place for clinical researchers. I was never someone who did basic science research, all of my research was based on clinical applications. With tinnitus and aural rehab, most of my research was based on what I heard and saw from my patients. Overall, if the research you're interested in pertains to an application in the clinic, it's essential to get clinical degrees. If you are going to do hearing science research without direct clinical application, just getting a PhD would suffice.

### **What are some directions that the field of hearing science and clinical audiology are moving in which would not be self-evident to most young clinicians and/or researchers in training?**

With regard to hearing science and clinical audiology, I think that integrating cognition with how hearing aids work is important. I also think that tinnitus is important and becoming more popular. I believe that the whole area of hearing aids is going to be interesting in the next 10 years because big electronics are really getting into amplification and wireless communication.

### **Can you please explain your interest in tinnitus?**

I have always found tinnitus interesting. When going for my PhD, I was interested in doing my dissertation on tinnitus, but my mentor, Dr. Raymond Carhart, said that tinnitus is so involved: physiology, psychology, and real clinical applications and it would take me many years to finish. So I abandoned that effort as a student. But as a professional, my interest was in part due because I felt that it was a clinically overlooked area.

### **Are there any new advances that will make "curing" tinnitus possible in the future?**

Yes. It will not be through the use of amplification, however. Psychological approaches like TRT and CBT will also not cure tinnitus. What I believe will eventually cure many forms of tinnitus is related to implantable technology in non-auditory areas of the brain. Research that looks at devices that help control Parkinson's tremors, for example, will have a direct application to tinnitus patients.

### *Did you know?....*

"Gifts from a Broken Jar" is a book (memoir) about an individual's recovery from TBI. It gives credit to auditory training for CAPD as a major reason for recovery.

## Visitor from Brazil-University of Campinas (UNICAMP)



Below is a commentary from Maria Isabel Amaral (pictured left). She is a professor at the University of Campinas who had the opportunity to visit our neuroaudiology lab.

“In April last year, during the 30th International Meeting of Audiology, I had the pleasure to be granted with the “Professor Maria Cecília Bevilacqua Award”, from the Brazilian Academy of Audiology (ABA), for the best 2014 Audiology doctoral thesis. As part of the prize, I received an allowance to conduct a technical visit abroad in an institution of my choice. Due to Dr. Musiek’s renowned contribution in the field of (central) auditory processing, I was very interested in

visiting his Neuroaudiology Lab at the University of Arizona with the purpose of improving my knowledge in the field. The two-week period that I was able to meet and follow Dr. Musiek’s work were an intense and productive time. In a short time it was possible to acquire new knowledge in the field of electrophysiology and auditory temporal processing. One of the academic activities that I enjoyed the most was being able to sit-in on Dr. Musiek’s classes about (C)APD. Everyone in the lab was very welcoming and willing to exchange experiences. Despite the short time, it was possible to spend a few hours during the weekend to get to know the beautiful city of Tucson, Arizona. The desert scenery and unusual landscape are remarkable in that city. I came to know a little of its history and understand part of the cultural influences. The Spanish influence is evident in the colors and joy that characterize many tourist spots. Hopefully I can return in other opportunities, whether due to partnerships in future research projects and academic activities, or to enjoy their rides and beautiful nature of Arizona.”

## Upcoming Presentations

**29th Annual Association for Research in Otolaryngology** in San Diego, CA, February 20-24, 2016

- **Everett, A., St. George, B., Denny, N. & Musiek, F.** The Angular Gyrus: New Views on its Anatomy and Location (poster)
- **St. George, B., DeMarco, A., & Musiek, F.** Unusual Morphology of the Posterior Sylvian Fissure: Trifurcations and False Ascending Rami (poster)

**American Auditory Society’s 43rd Annual Conference** in Scottsdale, AZ, March 3-5, 2016

- **Cheek, D., Filippini, R., & Musiek, F.** Audiologic evaluation of the Multiple Sclerosis Patient (poster).
- **Ceruti, J., Bernstein, L., & Musiek, F.** Behavioral and Electrophysiological Measures of Partially Filled Gap Detection Performance (poster).
- **Gonzalez, J. & Musiek, F.** The Onset-Offset N1-P2-Evoked Response in Individuals with High-Frequency Sensorineural Hearing Loss (poster).

**28th American Academy of Audiology Annual Conference** in Phoenix, AZ, April 13-16, 2016

- **Cheek, D., Filippini, R., & Musiek, F.** Audiologic evaluation of the Multiple Sclerosis Patient (poster).

- **Denny, N. & Musiek, F.** Frequency Pattern Perception for Lesions Along the Auditory Pathway (poster).
- **Everett, A., St. George, B., Denny, N. & Musiek, F.** The Angular Gyrus: New Views on its Anatomy and Location (poster).
- **Gonzalez, J. & Musiek, F.** The Onset-Offset N1-P2-Evoked Response in Individuals with High-Frequency Sensorineural Hearing Loss (poster).
- **Murphy, C., Samelli, A., Schochat, E., Musiek, F., Dillon, H., Bamiou, D.** Clinical Interpretation of Temporal Resolution Test Deficits Across Adulthood (poster).
- **Musiek, F. & Baran, M.** The Vertebro-Basilar System: The Silent Auditory Disorder (featured session).
- **Poff, L., Waryasz, S., Ceruti, J., Ramanathan, P., Musiek, F., & Skoe, E.** Sports-Related Concussion and Auditory Processing in Athletes: Implications for Speech Processing (poster).
- **St. George, B., DeMarco, A., & Musiek, F.** Revisiting Anatomical Variability Along the Sylvian Fissure: Its impact on Central Auditory Research. (poster).

**Academy Research Conference** in Phoenix, AZ, April 13, 2016

- **Cheek, D., Filippini, R., & Musiek, F.** Audiologic evaluation of the Multiple Sclerosis Patient (poster).
- **St. George, B., DeMarco, A., & Musiek, F.** Unusual Morphology of the Posterior Sylvian Fissure: Trifurcations and False Ascending Rami (poster).

## Pathways Meeting

The upcoming Pathways meeting will be held during the AAA conference on Friday April 15, 2016 from 11AM-1PM in Phoenix, Arizona, at the Convention Center, Room 105 ABC. For more information, contact Cydney Fox ([cydneyfox@gmail.com](mailto:cydneyfox@gmail.com)) or check on the AudiologyNOW! website.

## Academy Research Conference

The Academy Research Conference (ARC) is a full-day conference that is taking place on the first day of the American Academy of Audiology's (AAA) AudiologyNOW! on Wednesday April 13<sup>th</sup>. This will be taking place at the Sheraton Phoenix Downtown hotel in Phoenix, Arizona. The topic of this one-day conference is **Central Auditory Processing Disorders: Evaluation and Treatment**. This conference will include an outstanding list of speakers: Harvey Dillon, Jos Eggermont, Holly Fitch, Ken Hugdahl, Stephen Lomber, Kathleen Pichora-Fuller, and Jeffrey Weihing. Over 40 posters have been accepted for presentation and there is already a heavy enrollment of attendees.

## Our Recent Lab Group Picture!



(From Left: Dr. Frank Musiek, Dr. Renata Filippini, Andrew DeMarco, Nicole Denny, Alyssa Everett, Maria Isabel Amaral, Diane Cheek, Barrett St. George, and Bryan Wong)

### Recent Articles of Interest

#### **The functional anatomy of central auditory processing disorders.**

T.E. Cope, D.M. Baguley, & T.D. Griffiths

*Journal: Practical Neurology*

#### **Listening to another sense: Somatosensory integration in the auditory system**

C. Wu, D. Martel, & S. Shore

*Journal: Cortex*

#### **Testing the dual-pathway model for auditory processing in the human cortex**

I.C. Zündorf, J. Lewald, H. Karnath

*Journal: NeuroImage*

## Past Neuroaudiology Newsletters/Other Important Neuroaudiology Sites

- **March 2015 Newsletter:** <http://slhs.arizona.edu/wp-content/uploads/2015/03/Neuroaudiology-Newsletter.pdf>
- **May 2015 Newsletter:** <http://slhs.arizona.edu/wp-content/uploads/2015/04/MayNewsletter3.pdf>
- **July 2015 Newsletter:** <http://slhs.arizona.edu/wp-content/uploads/2015/07/JulyNewsletter.pdf>
- **September 2015 Newsletter:** <http://slhs.arizona.edu/wp-content/uploads/2015/08/September-Newsletter.pdf>
- **November 2015 Newsletter:** <http://slhs.arizona.edu/wp-content/uploads/2015/11/November-Newsletter-AuD.pdf>
- **January 2016 Newsletter:** <http://slhs.arizona.edu/wp-content/uploads/2016/01/January-Newsletter.pdf>
- <http://musik.faculty.arizona.edu/>