

Neuroaudiology Newsletter

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Angular Gyrus in the News

The role of the angular gyrus in the auditory system has been in question for quite some time now. It is also unclear where the angular gyrus is in the brain because of the different anatomical claims of its location. The University of Arizona's Alyssa Everett, Nicole Denny, Barrett St. George, and Dr. Musiek (all pictured below) are currently reviewing the literature and 3D images of normal brains from MRIs to develop a better understanding. The review will incorporate the anatomy/physiology of the angular gyrus and a study of 3D imaged brains to determine the reliability of the anatomical claims of its location.



(Pictured above from left: Barrett St. George, Nicole Denny, Diane Cheek, Alyssa Everett, and Frank Musiek)

Washington University T35 Research:

Two of Dr. Musiek's students from the University of Arizona, Alyssa Everett and Angela Yung, have been awarded research fellowships as part of a federally-funded research training program over the summer at Washington University in St.

Academy Research Conference

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April 13, 2016 will be the date for the Academy Research Conference (ARC) at the American Academy of Audiology (AAA) to be held in Phoenix, Arizona. The research topic will be Central Auditory Processing Disorder (CAPD). This annual program is sponsored by NIH and AAA. It aims at convening top researchers in the field to present their work in this full-day conference. Student scholarships will be available for this event. Also, poster sessions will be open to those who would like to submit their work on CAPD.

Louis. The positions are part of an NIDCD-funded T-35 research training grant awarded to **Dr. William W. Clark**, director of the Program in Audiology and Communication Sciences at Wash U. **Kevin Ohlemiller, PhD**, a research associate professor in the Department of



Otolaryngology is serving as mentor to Alyssa (pictured on left), and **Mitchell Sommers, PhD**, a professor in the Department of Psychology is serving as mentor to Angela (pictured on right). Alyssa is studying the dynamics of permanent noise-induced threshold shifts (PTS) in different ages and strains of inbred mice. Specifically, she is analyzing age- and genetically-related differences in severity of PTS using the dose-response paradigm to facilitate comparison with cellular injury. She is also studying the relationship between PTS severity and changes in glucose transport in cochlear lateral wall. Angela is doing research in speech in noise perception and comparing the performance of young and old adults to gain a better understanding of the mechanisms used by older adults when understanding speech in noise. In particular, her research is looking into how priming effects speech in noise perception in incongruent sentence conditions.

PhD Defenses Summer 2015

Julianne Ceruti, University of Connecticut, successfully defended her PhD dissertation entitled "**Behavioral and Electrophysiologic Detection of Partially Filled Gaps in Noise**" on June 12. Julianne's major advisor was Frank Musiek (University of Arizona). Kathy Cienkowski, Co-major Advisor (U. Conn), Les Bernstein, Associate Advisor (U. Conn), Jeff Weihing, Associate Advisor (University of Louisville), and Shannon Palmer, Associate Advisor (Central Michigan University), were also part of her team. Julianne demonstrated by both behavioral and evoked potential (N1, P2) measures that gap depth has a marked effect on gap detection. Also highlighted was the finding that gap depth can be "traded" with gap duration. Performance of normal hearers was non-linear for changes in gap depths of 25, 50, and 75 percent. This additional index of gap detection may lead the way to the development of new test procedures for measuring central auditory function.

Jennifer Gonzalez, University of Connecticut, will also be defending her PhD dissertation this summer. Frank Musiek, University of Arizona, is her major advisor.

Vertebral-Basilar System



Mallory Brown (pictured left), University of Connecticut, performed a comprehensive literature review of the vertebral-basilar system for her Capstone project. In addition to the review, she made direct anatomical observations and measurements of **3 human cadaver** half brains. For her project she reviewed the blood supply to the auditory system which is crucial for **proper auditory functions**. Compromise of the blood supply is a major contribution to both hearing and

balance disorders. Despite the importance and its key role in auditory function, vascular anatomy is often neglected in the field of audiology. There has been variability shown in the vasculature, which can be very complex. However, knowledge of the anatomy can aid in understanding normal function as well as clinical symptoms. The vertebral basilar system provides the blood supply to the auditory brainstem structures, as well as the cochlea. The goal of this project is to review, synthesize and analyze the vertebral basilar system and to discuss clinical implications.

Dichotic Word Tests

Dichotic listening is the simultaneous presentation of auditory input to each ear where information from each ear will travel through the central auditory nervous system (CANS) primarily through contralateral pathways starting at the cochlear nucleus. This means that right ear input will ascend in a direct path to the left hemisphere, the location for language processing in a large majority of people. Left ear auditory input will ascend to the right hemisphere and must cross the corpus callosum to the left hemisphere for processing. Dichotic listening tasks measure the laterality of auditory processing for the right at left hemispheres and in some cases, can help determine whether a person has an impairment along their interhemispheric auditory pathways.

The University of Arizona's doctoral audiology students, Diane Cheek and Barrett St. George (pictured earlier) are currently working on a dichotic listening project. Using audio editing software (Audacity) they are rearranging the original W-22 word lists dichotically with simultaneous onsets and offsets. The next step will be to test the newly created stimuli on listeners.

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>*
- *<http://musiek.faculty.arizona.edu/>*
- *For weekly updates on new neuroaudiology articles refer to the Neuroaudiology section of Pathways on HHTM: <http://hearinghealthmatters.org/pathways/>*