

**SPECIAL POINTS
OF INTEREST:**

- **A new start for the anechoic chamber**
- **NCRAR at AudiologyNow 2010**

**INSIDE THIS
ISSUE:**

Message from the Director 1, 4

Anechoic Chamber 1, 3

Meet Serena Dann, Research Audiologist 2

Upcoming NCRAR Events 4

NCRAR Publications and Presentations 5, 6, 7

NCRAR Comings and Goings 7

NCRAR Grants funded 1/10 to 4/10 7

NCRAR at AudiologyNow 2010 8

NCRAR Newsletter

VOLUME X, ISSUE II

APRIL 2010

Message from the Director: Stephen Fausti, Ph.D.



This past month, it was with great honor, humility, fulfillment, and pride that I accepted the James Jerger Research Career in Audiology Award. I am humbled to have been selected to receive this honor, and to join the company of such distinguished recipients as Jim Jerger himself, and the other previous recipients of this award. At the time I received notification of my selection for this award, it caused me to reflect back on my career and past life experiences. Being raised on a farm in a small, rural farming community, I was infused with the importance of a strong work ethic and perseverance. Most importantly, I learned the need for continued nurturing to successfully grow things.

We all have our stories from where we began to where we presently are. However, the common thread through all of our stories is that there have been, and remain, individuals who have provided the elements for growth and success: mentoring, support, encouragement, collaboration, and assistance in helping us to reach our goals. I feel exceptionally fortunate to have had so many colleagues offer their unconditional friendship and

(Continued on Page 4)

A New Start for the Anechoic Chamber by Frederick Gallun, Ph.D.

In 2006, the NCRAR opened the doors to its new home, which included an extremely unusual piece of equipment: an “anechoic chamber”. Weighing 20,000 kg (44,100 lbs) and measuring over 20 feet on each side, this large cubic testing chamber is lined with large sound-absorbing wedges on the walls, floor, and ceiling to make it “anechoic”, which means “without echoes”. The first anechoic chamber was built in 1936, and design improved steadily over the next decade. The NCRAR anechoic chamber is built on a plan that follows the principles of acoustic design laid out at that time. These principles ensure that whenever a sound is produced in the chamber, it travels from the source of the sound to the person or object receiving the sound with no reduction in energy due to disturbances in the sound field. At the same time, any sound that reaches the walls, floor or ceiling is almost entirely absorbed by large fiberglass wedges (see Figure on Page 3).

(Continued on Page 3)

Location information**NCRAR is located at:**

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Meet Serena Dann, Research Audiologist

Although I was born in Rochester, New York, I grew up in Kettering, Ohio, a suburb of Dayton. I lived in a cul-de-sac with lots of similarly aged children nearby, so I spent a bunch of my free time running around playing jailbreak, riding bikes to the park or the pool, and partaking in many other carefree activities. Growing up as a first-generation Chinese American, I attended Chinese school on Sunday afternoons. Similar to most of my peers, I resented having to spend half of my day off from school in the classroom. However, looking back, it was an enriching experience that helped give me a better appreciation of my background and culture. While I, most unfortunately, did not develop the best language skills, I did learn how to perform a mean plate dance.

I completed my undergraduate studies at Case Western Reserve University in Cleveland.

Most of the people who attend Case plan to go into engineering or pre-medical studies, and when I started, I was one of those (pre-med) people. After realizing pre-med was not for me, I took up interests in communication disorders, nutritional science, psychology, and economics. Needless to say, I wasn't quite talented enough to combine all of these areas of study into one, so I stuck with the communication disorders

route and ended up with a bachelor's degree (but with minors in psychology and economics!). Quickly realizing that I did not want to be a speech pathologist, I decided that a career in audiology would be the next, most reasonable path and so I moved onto my next destination – Northwestern University.



NU gave me the opportunity to explore the diversity of audiology. Amidst the more conventional hospital and ENT clinic placements, I also had the opportunity to work in a hearing aid research center and a musicians' clinic. Through these different exposures I began to realize that I really enjoyed the hearing conservation side of things. After all, what better way to help people than to educate them about preventing hearing loss in the first place? It was this interest in hearing conservation that brought me to NCRAR. While moving far away from loved ones was tough, I was excited to partake in the opportunity to help develop a hearing conservation program (which hopefully will be available to the general public someday). Plus, I could explore a part of the country that was uncharted territory to me. I currently work on four different studies, two related to hearing loss prevention and two related to speech understanding in older adults with hearing loss. I feel very fortunate to work in such a nurturing environment full of such innovative and passionate people.

This past September I had the pleasure of marrying my confidante of eight years. Kyle and I met while at Case, and even though we only had about 500 people in our class, we still managed to complete the four years without having a single class together. Outside of work I enjoy spending time reading, baking/cooking, exploring the outdoors, hanging out with friends, and taking full advantage of what the surrounding area has to offer.



A New Start for the Anechoic Chamber (cont from Page 1)

What is the benefit of having such a testing chamber?

One of the very useful things the human auditory system can do is detect and locate sound sources in the dark and behind our backs. Our ability to localize sounds is also extremely useful for listening to one person talk when there are other noises in the environment. Echoes disrupt the cues we use to localize sounds. For scientists, it is useful to be able to study localization in an echo-free environment, to see just what the auditory system can do when sound is not disrupted. Prior to the development of anechoic chambers, scientists made an echo-free testing environment by conducting research on a platform elevated 10 feet above the roof of a building! This is an unsatisfactory place to do auditory research for a number of obvious reasons, not the least of which is the much greater noise levels one finds in the cities today compared with 75 years ago. With the development of anechoic chambers, researchers were able to finally test the ability of listeners to identify the locations of sounds without any interfering echoes.



How is the NCRAR anechoic chamber used?

Researchers at the Portland VA use the chamber to examine the impacts of hearing loss, aging, and wearing hearing aids on basic sound localization, as well as hearing one talker in a mixture of other talkers. For instance a study has been done examining whether modern directional hearing aids disrupt sound localization ability as they amplify sounds in front more than sounds behind or to the sides of the listener. Another study is looking at how hearing loss can reduce the sensitivity of listeners to spatial cues. We are working to understand the ways in which this impacts performance in artificial situations that systematically capture the difficulties listeners face in real-world situations like dinner parties and other social events where many people are talking at once. So far, this work has involved headphone experiments, but testing has now started in the anechoic chamber where much more realistic situations can be tested.



Why did the chamber need an upgrade?

The first full experiment to be performed in the anechoic chamber demonstrated the ability of the chamber to provide useful data on a real-world situation important to our Veterans. However, it also revealed limitations in the design of the equipment and loud speakers in the chamber that limited us to having only one experimental set up at a time. We are redesigning it to be more flexible. The anechoic chamber upgrade team consists of Roger Ellingson, Peter Jacobs, Sam Gordon, Pat Helt, Stephen Fausti, and me. Together we determined that we needed an elaborate system of switches that could be used to route sounds from any one of five different experimental testing systems to the speakers hanging in the anechoic chamber (see Figure). Today, a system of switching panels and routing hardware is in place that allows one experiment to be run in the morning, another to be run in the afternoon, and detailed acoustical measurements to be made during the night without any interruptions or interference between each. The improvement in efficiency and productivity is already clear so expect to see much more spatial hearing research coming out of the NCRAR in the future!

Upcoming NCRAR Events 2010



April 30 2010: Weon Jun O.D. Staff Optometrist, Portland VA Medical Center. Title: *Optometry for Audiologists.*

May 21 2010: Shilpi Banerjee, Ph.D., Starkey Laboratories Inc., *Hearing Aid Reality Check.*

June 18 2010: Sumit Dhar, Ph.D. Northwestern University

Title: Adventures with the Structure of Otoacoustic Emissions.

July 16 2010: Lina Reiss, Ph.D. Department of Otolaryngology at the Oregon Health & Science University, Portland OR. Title: *Plasticity of pitch perception with cochlear implants*

August 6 2010: Ben Hornsby, Ph.D. Vanderbilt Bill Wilkerson Center, Vanderbilt University Medical Center, Nashville TN. Title: *TBD*

September 10: Brenda Ryals, Ph.D. Department of Communication Sciences and Disorders, James Madison University, Harrisonburg VA. Title: *TBD*

December 3 2010: Judy Dubno, Ph.D. Department Otolaryngology - Head and Neck Surgery, Medical University of South Carolina, SC. Title: *TBD*

Most NCRAR seminars are broadcast live via v-tel to other VA facilities. Contact bonnie.becker@va.gov for information.

Seminars are held from 12 to 1 pm in PVAMC Building 101 Room 109, unless noted.

Message from the Director (continued from Page 1)

support throughout the years. A few individuals warrant special recognition, including: Dr. John Kendall, Dr. Walter McDonald, Dr. Mindy Aisen, Dr. Jerry Northern, Dr. Allen Ryan, Dr. Brenda Lonsbury-Martin, Dr. John Feussner, Dr. Cynthia Fowler, Dr. Harry Levitt , Dr. Dennis Smith, Dr. David Phillips, Dr. James Nixon, Dr. Phillip Yantis and Patrick Helt.

I especially want to express my gratitude to my wife Gwen and our family: Teresa, John, Janel, and Kristina who have been there to advise and be supportive.

I also want to thank the members of the NCRAR, who have, because of their contributions, dedication, and commitment, helped to transform a vision into reality. I never imagined that my interest in auditory research would someday put me in a position to develop the VA National Center for Rehabilitative Auditory Research and give me the rewarding opportunity to nurture and support so many dedicated and talented audiologists and auditory researchers, or to be the recipient of such a



Stephen Fausti receiving the Jerger Award for Research from Brenda Ryals.

prestigious award.

I would like to give my heartfelt thanks to those who nominated me and the American Academy of Audiology awards committee for my selection. Those who have supported me along the way have helped me to grow and flourish from a small seed. This is an honor that I will cherish.

NCRAR Publications and Presentations January 2010 - April 2010

<u>Publications:</u>		
Best V, Gallun FJ , Mason CM, Kidd G, Shinn-Cunningham BG. The impact of noise and hearing loss on the processing of simultaneous sentences. <i>Ear & Hearing</i> . 2010; 31(2):213-220.	changes in hearing aid gain. <i>Int J Audiol</i> . Submitted, 2010.	RL , et al. The Tinnitus Functional Index: A new clinical measure for chronic, intrusive tinnitus. <i>Ear and Hearing</i> , submitted 2010.
Gallun FJ . Detection of intensity increments in auditory non-speech sequences. <i>Journal of the Acoustical Society of America</i> . 2010; 127(4):EL166-171.	Cameron M , Haselkorn JK, Poel A, Linke A, Bourdette D. Falls in Veterans with Multiple Sclerosis: A Cohort Study. <i>JRRD</i> . Submitted, 2010.	Saunders GH, Folmer RL, Griest SE, Dann SM . Development of a Computer-based, Multi-media Hearing Loss Prevention Program. <i>Noise & Vibration Worldwide</i> , submitted 2010.
Henry JA, Zaugg TL, Myers PM, Kendall CJ. Progressive Tinnitus Management: Counseling Guide. Long Beach, CA: VA Employee Education System, 2010.	Dille M, McMillan G, Wilmington D, Fausti SF, Konrad-Martin D . The influence of treatment and patient characteristics on cisplatin ototoxicity: the dose-hearing model. <i>JASA</i> . Submitted, 2010.	Presentations: Billings CJ . Age and signal type effects on signal-in-noise cortical encoding. Poster at the American Auditory Society Annual Meeting, Scottsdale, AZ, March 2010.
Lewis MS, Gallun F , Gordon J, Lilly D, Crandell C. (2010). A pilot investigation regarding speech-recognition performance in noise for adults with hearing loss in the FM+HA listening condition. <i>Volta Review</i> . 2010;110(1): 31-54.	Dille M, McMillan G , Reavis K, Jacobs P, Fausti SF, Konrad-Martin D. Incorporating the Dose-Hearing model of cisplatin ototoxicity with distortion product otoacoustic emissions. <i>JASA</i> . Submitted, 2010	Brennan M, Souza P, Gallun FJ . Do aided psychoacoustic thresholds predict speech recognition? Presented at American Auditory Society Scientific and Technical Meeting in Scottsdale, AZ, March 4-6, 2010
Souza P, Gallun F . Hearing aid amplification and consonant modulation spectra. <i>Ear & Hearing</i> . 2010; 31(2):268-276	Folmer RL, Saunders GH, Dann SM, Griest SE, Leek MR, Fausti SA . Development of a Computer-based, Multi-media Hearing Loss Prevention Education Program for Veterans and Military Personnel. <i>ASHA Perspectives</i> , submitted 2010.	Cameron M . Presentation on exercise for people with MS given as part of Navigating the Maze conference. Portland, OR, January 14, 2010.
Submitted publications:		
Billings CJ, O'Connell Bennett K, Molis MM, Leek MR. Cortical neural encoding of signals in noise: effects of stimulus type and recording paradigm. <i>Ear & Hearing</i> . Submitted 2010.	Gallun FJ . Temporal integration of monaural and binaural stimuli by younger and older listeners. <i>Journal of the Acoustical Society of America, Express Letters</i> . Submitted 2010.	Carlson J, Diedesch A, Beasley R, Tsukuda P, Gallun F . Modeling the Role of Aging in Binaural Interference. Poster presented at the American Auditory Society, Scottsdale, AZ, March 4-5, 2010.
Billings CJ, Tremblay KL. Aided cortical auditory evoked potentials in response to	Meikle MB, Henry JA, Griest SE , Stewart BJ, Abrams HB, McArdle R, Myers PJ, Newman CW, Sandridge S, Turk DC, Folmer	Dann S, Schwartz K, Ellingson R, McMillan G, Gallun FJ, Jacobs P, Konrad-Martin D . Simultaneous tests of temporal

NCRAR Publications and Presentations (Continued from Page 5)

<p>acuity and across-frequency temporal integration in older listeners. Presented at American Auditory Society Scientific and Technical Meeting in Scottsdale, AZ, March 4-6, 2010</p>	<p>Education Program for Veterans and Military Personnel. National Hearing Conservation Association Annual Conference, Orlando, FL, February 26, 2010.</p>	<p>Midwinter Meeting, Anaheim, CA, February 2010.</p>
<p>Diedesch A, Kubli L, McDermott D, Walden T, Leek M. Central Auditory Processing in Blast Exposed Soldiers: A preliminary analysis. Podium presentation at the American Auditory Society, Scottsdale, AZ, March 6, 2010.</p>	<p>Gallun FJ, Diedesch AC. Auditory Processing and Blast Injury. NCRAR monthly seminar series talk, March 26, 2010.</p>	<p>Konrad-Martin D (2010). Young Investigator Presentation: Research: A Team Sport. Invited, NIH Sponsored podium presentation given at the American Auditory Society Annual Conference, March 2010</p>
<p>Dille MF, McMillan GP, Ellingson RM, Fausti SF, Konrad Martin D. Comparison of Objective Measures for the Early Detection of Ototoxicity. Presented at American Auditory Society Meeting held in Scottsdale, AZ March 4-6, 2010</p>	<p>Gallun FJ, Diedesch A, Beasley R, Tsukuda P. Influences of aging on memory for intensity. Assoc. Res. Otolaryngol. Abs.: 883. Presented at 33rd Midwinter Meeting of the Association for Research in Otolaryngology, held in Anaheim, CA, February 8-10, 2010.</p>	<p>Leek MR. Closer to the Edge. Presentation to Department of Speech and Hearing Science, Arizona State University, Tempe, AZ, March 2, 2010.</p>
<p>Durig B, Melamed S, Molis MR, Leek MR. Combat Arms Earplugs and speech understanding in noise. Poster presented at annual meeting of American Auditory Society, Scottsdale, AZ, March 5, 2010.</p>	<p>Gladd D, Saunders GH, Pulliam P. (2010). Ambient Noise Levels in the Chemotherapy Clinic. Student poster to be presented at the American Auditory Society, Scottsdale, AZ, March 4-6.</p>	<p>Leek M, Molis M. Contribution of phase and amplitude cues to identification of vowel-like harmonic complexes. Auditory Cognitive Neuroscience Society annual meeting, Tucson, AZ, January 7, 2010.</p>
<p>Folmer RL, Saunders GH, Dann SM, Griest SE, Leek MR, Fausti SA. Development of a Computer-based Hearing Loss Prevention Education Program for Veterans and Military Personnel. Joint Defense Veteran Audiology Conference, Orlando, FL, February 23, 2010.</p>	<p>Henry JA. Evaluation and Measurement of Tinnitus. Focus Group for CHEER (Creating Healthcare Excellence through Education and Research) National Research Network, Alexandria, VA, January 22, 2010.</p>	<p>Lilly DJ. Evoked potentials: What are they? What can they tell us? Invited presentation to the 38th Annual Tri-State Hearing Convention, Seattle, WA, February 4-7, 2010.</p>
<p>Folmer RL, Saunders GH, Dann SM, Griest SE, Leek MR, Fausti SA. Development of a Computer-based Hearing Loss Prevention</p>	<p>Jacobs PG, McMillan G, Dann S, McDermott D, Wan EA, Konrad-Martin D. Stimulus frequency otoacoustic emission amplitude and latency estimates using time domain methods: Effects of stimulus level, hearing threshold and aging. Poster presented at the ARO</p>	<p>Myers PJ, Saunders GH, Abrams HA, Chisolm T. Evaluation of Approaches to Auditory Rehabilitation for mild TBI. Invited presentation at Joint DoD/VA Audiology Conference, Orlando, Florida, February 23, 2010.</p>
		<p>Myers PJ, Henry JA, Zaugg, TL, Kendall, CJ. Progressive Tinnitus Management. Joint DoD/VA Audiology Conference, Orlando, FL, February 23, 2010. (Invited presentation presented by Myers)</p>

NCRAR Publications and Presentations (Continued from Page 6)

<p>O'Connell Bennett K, Billings CJ, Molis MR, Leek MR. Informational masking of cortical evoked potentials and of speech discrimination. Poster presented at annual meeting of American Auditory Society, Scottsdale, AZ, March 5, 2010</p> <p>Rajaram S, Kurkij N, Gallun FJ, Best V, Shinn-Cunningham BG. How object formation can influence speech perception. Assoc. Res. Otolaryngol. Abs.: 873. Presented at 33rd Midwinter Meeting of the Association for Research in Otolaryngology, held in Anaheim, CA, Feb. 8-10, 2010.</p>	<p>Saunders, GH. Dual Sensory Impairment: Where are we now? Where must we go from here? Invited Audiology Online e-Seminar. February 11, 2010. Course accessible at http://www.audiologyonline.com/ceus/ recordedcoursetdetails.asp?class_id=15564</p> <p>Saunders GH, Fausti SA, Folmer RL, Gallun FJ, Henry JA, Myers PJ, Leek MR, Wilmington DJ. Ongoing Research at the National Center for Rehabilitative Auditory Research: VA-DoD Collaborations and other</p>	<p>Studies. Poster presented at the Joint Defense/Veterans Audiology Conference Orlando FL Febuary 22-24, 2010.</p> <p>Sweetow RW, Clark JG, Preminger JE, Saunders GH, Thibodeau L. Current Topics in Audiologic Rehabilitation - Panel Discussion. February 12, 2010. Course accessible at http://www.audiologyonline.com/ceus/ recordedcoursetdetails.asp?class_id=15563</p> <p>Turbin, MB. Dual Sensory Loss: Where We Are Now and Where We Should Go? NCRAR Seminar. February 5, 2010.</p>
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NCRAR comings and goings.....

Welcome to:

- Heather Belding, Research Assistant, who worked previously at OHSU
- Christina Paul, Program Assistant, who moved from Florida to join the NCRAR

Congratulations to:

- Garnett McMillan and his family on the birth of their new son and brother, 'Nico'
- Gino Galvez and his family on the birth of their new daughter and sister Violet

Goodbye and good luck to

- Jeff Shannon and his wife Erin on their move to New York
- Patrick Tsukuda who has gone on to nursing school
- Patty Felbinger who has taken a job with the Department of Agriculture
We'll miss you all..

NCRAR Grants funded 1/10 to 4/10

<p>Dille M (PI) Konrad-Martin D (Co-PI). Individualized Objective Techniques for Early Detection of Ototoxicity. VA RR&D.</p> <p>Folmer, RL (PI). Clinical Trial of Transcranial Magnetic Stimulation for Relief of Tinnitus. VA RR&D.</p> <p>Henry JA, Zaugg TL, Myers PJ (PIs). Telehealth Tinnitus Intervention for Patients with TBI. VA</p>	<p>RR&D.</p> <p>Turbin MT (PI), Echt K, Henry JA, Suhler E (CO-Is). Self Management Groups for Veterans with Dual Sensory Loss. VA RR&D Pilot Project.</p> <p>Konrad-Martin D (PI), Gallun F (Co-I). Determinants of word recognition speed in older adults. VA RR&D.</p>
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NCRAR at AudiologyNow 2010

As in previous years, several members of the NCRAR attended the American Academy of Audiology's AudiologyNOW! annual conference, which was held this year in sunny San Diego. San Diego's beaches, warm weather and sun provided this year's attendees of AudiologyNOW! with an excellent location for their meeting. The NCRAR members who attended were highly involved in a variety of ways with the largest audiology conference of the year.

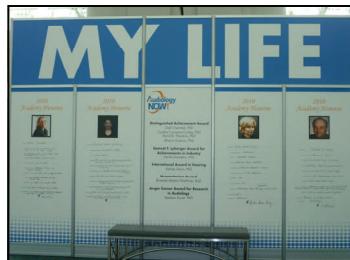
The highlight of the NCRAR's presence at AAA was Dr. Stephen Fausti's receipt of the Jerger Award for Research in Audiology. This award honors individuals who have had a distinguished career in audiology, both in areas of research and in the practice and/or teaching of audiology. Dr. Fausti received his award at the Award's Dinner accompanied by his wife and children and several members of the NCRAR. The



Stephen Fausti and his family at the Awards

other NCRAR members who attended the convention were Gaby Saunders, Curtis Billings, Samantha Lewis, Tara Zaugg, Jim Henry, Jeff Shannon, Sean Kampel and Kara Schwartz. Sean Kampel coordinated and ran the NCRAR booth

while the other members taught seminars, gave talks and presented posters on their research findings. In addition, Gaby Saunders participated in a panel discussion on audiology rehabilitation and Samantha Lewis chaired the Research Podium Subcommittee. Kara Schwartz received a student scholarship to present a poster on aging and the perception of stimuli at the Academy Research Conference.



Meanwhile, the NCRAR booth provided AAA attendees with information and resources on our mission, research activities and our publications. This year we handed out informational CDs which included extensive information about our center. Members of the NCRAR staff were also able to speak with several audiology students and provide them with information about NCRAR externships and summer internships. It was another excellent AAA conference in which the NCRAR was able to disseminate research findings as well as engage with the audiology community as a whole. More to come in the windy city of Chicago in 2011!



Sean Kampel at the NCRAR booth

