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DR. RICHARD J. BELLUCCI Translational Hearing Center
Creighton University
Creighton UNIVERSITY
School of Medicine

Bellucci Translational Hearing Center NEWSLETTER

Pictured are various members of the Bellucci Translational Hearing Center

Overview

In this edition of the Bellucci Translational Hearing Center Newsletter, we are excited to highlight the upcoming 2025 Bellucci Symposium, which promises to be a platform that will bring fresh perspectives to our initiatives. We welcome our newest executive team member who is sure to help guide our strategic goals. Additionally, we're thrilled to announce our new Pilot Projects aimed at advancing our research goals. We would also like to congratulate our Bellucci Scholar award winner. Our Research Project Leaders continue their outstanding progress. Later in the newsletter we celebrate the valuable opportunities that are presented due to the Stemm-Hear internships. Lastly, we shine a spotlight on Bellucci Fellow Regina Gendzelevski Kelmann. All of these achievements and individuals help to make the Bellucci Translational Hearing Center the best that we can be!

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BTHC Director Earns $1 million NIH Grant

Peter Steyger, PhD, earned a $1 million NIH grant that aims to support two new graduate students who live with hearing loss for at least four years. This support will include tuition, insurance, fees and stipends. Our director understands first hand the importance of the sense of belonging that the students will receive because of this grant. We hope to develop a community that will continue to help make those with hearing loss feel less alone. Look for this grant to start helping students in the 2025-2026 school year.

BTHC Director, Peter Steyger, PhD

AVT Core Microscope

Microscopy-based imaging continues to be a critical research tool for investigators associated with the Translational Hearing Center. Furthermore, vast improvements have been made to imaging technology in the past decade.Meanwhile, two of the AVT Core's confocal microscopes with the heaviest usage are long overdue for retirement and replacement. With this in mind, the AVT recently purchased an additional laser scanning confocal microscope, Nikon's AXR with an NSPARC detector. This microscope will be installed in early 2025 and will be critical for the long-term sustainability of the Advanced Imaging Core Facility. Nikon has a solid reputation for producing and servicing high quality microscopes, and the AXR offers speed, sensitivity, resolution, and AI processing tools that will be valuable to the many researchers who utilize the facility.

2025 Bellucci Symposium

The 2025 Bellucci Symposium will be held on Friday, May 23rd, 2025. If you plan to attend in-person please register as soon as possible to ensure that you will receive complimentary lunch service. This years symposium will be held both in-person in Omaha, Nebraska and online. This year's symposium will focus on: Noise induced hearing disorders. If you have any questions please reach out to Charles Klinetobe (charlesklinetobe@creighton.edu).

Click Here to Register

New Executive Team Member!

The Bellucci Translational Hearing Center is thrilled to welcome Gabrielle Merchant, PhD from Boys Town National Research Hospital to our Executive Team. Dr. Merchant adds valuable knowledge to our team and we are looking forward to working together to advance hearing research.

Gabrielle Merchant, PhD

New Center Faculty Members

Jemma Webber

The Bellucci Translational Hearing Center is excited to welcome one of our newest faculty hires Jemma Webber, PhD. Dr. Webber has plans to apply for a Research Project Leader position within the Bellucci Translational Hearing Center. Dr. Webber is one of the many reasons we are excited about the direction of The Center. Welcome Dr. Webber!

Justine Renauld

The Bellucci Translational Hearing Center is excited to announce one of our newest faculty hires Justine Renauld, PhD. Dr. Renauld has also been selected as our newest Research Project Leader, more information regarding Justine's Research Project Leader Project can be found later on in this newsletter. Welcome to The Center Dr. Renauld!

New Pilot Project Awardees

Oleg Korzyukov

The Bellucci Translational Hearing Center is excited to welcome Andrew Wagner to the center as a Pilot Project Awardee. Dr. Koryukov.

Age-related neurodegeneration is a devastating brain condition, manifesting in the deterioration of essential cognitive functions such as auditory processing. Central auditory processing relies on the transmission of information from the brainstem to cortical neuronal populations and involves the interplay between networks distributed across temporal and frontal lobes. Neurodegeneration affecting these auditory networks is a significant factor contributing to age-related neurodegenerative diseases like Parkinson's disease (PD) and Alzheimer's disease (AD). Click here to read more.

Andrew Wagner

The Bellucci Translational Hearing Center is excited to welcome Andrew Wagner to the center as a Pilot Project Awardee. Dr. Wagner

The vestibular system is responsible for sensing the complex head motions that occur during daily life. As a result, vestibular dysfunction can cause symptoms of dizziness, nausea, and/or unsteadiness during routine activities. Relative to other causes of dizziness, vestibular dysfunction leads to a greater decline in quality of life and a higher utilization of medical resources. Due to the considerable variability in clinical presentations, personalized rehabilitation strategies are needed to address the symptoms of chronic vestibular dysfunction. Click here to read more.

Bellucci Scholar Lauren Sullivan

Lauren Sullivan

Lauren Sullivan is the first recipient of the Dr. Richard J. Bellucci Doctoral Scholarship. Lauren came to Creighton from the Uri Manor Lab at the University of California, San Diego and was drawn to hearing science because of the beauty of the inner ear. “I find it so incredible that we have such a perfectly formed and balanced organ,” she said. “Every other organ is an ill-defined mess, but the inner ear has these wonderfully organized cells and structures that make it so aesthetically pleasing to study.”

Lauren said the decision to come to Creighton was easy. “The dedication Creighton has to studying hearing loss is quite attractive to someone also dedicated to studying hearing loss!” She added, “the school is beautiful, with a tight knit community I knew I wanted in a doctorate program. It is very exciting to be somewhere where hearing research is the majority, where at most institutions it is a small minority.”

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The Auditory & Vestibular Technology (AVT) Core is established to provide infrastructure to support Research Project Leaders and principle investigators associated with the Dr. Richard J. Bellucci Translational Hearing Center to conduct auditory and vestibular research across the full range of experimental model systems, from single molecule analysis to whole organism models. The AVT Core is located within the Criss Building complex of Creighton University School of Medicine and is under the direction of core director Michael Nichols, PhD.

Click Here for Core Fee Schedule

Our Current Research Project Leaders

Transcription factor POU4F3 is indispensable for the differentiation and homeostasis of sensory hair cells, the essential cell type converting mechanical vibrations into electrical signals for hearing function. During hair cell differentiation, the pioneer factor activity of POU4F3 is required for ATOH1 to access many inaccessible elements to up-regulate hair cell genes. In mature hair cells, reduction of POU4F3 transcription activity due to mutations in one allele leads to hair cell death and hence progressive hearing loss (DFNA15,autosomal dominant non-syndromic hearing loss 15). It remains unclear how the expression of POU4F3 gene is regulated at different developmental stages... Click here to read more.

Litao Tao, PhD

Justine Renauld, PhD

Ménière's disease (MD) is characterized by symptoms such as hearing loss and vertigo, but its underlying cause is still unclear. Research on the temporal bones of MD patients has identified a condition known as endolymphatic hydrops, marked by an expansion of the scala media, indicating a disruption in fluid balance within the inner ear. Endolymph, a vital fluid within the membranous labyrinth, is essential for maintaining hearing and balance. However, the mechanisms that regulate this fluid are not yet fully understood. Given the critical role of fluid homeostasis in the inner ear, our research aims to investigate the formation of endolymphatic hydrops and its impact on neuronal dysfunction. Click here to read more.

Our Most Recent RPL Graduate

Aminoglycosides (AG) have broad antibiotic spectra against aerobic gram-positive and gram-negative bacteria and mycobacterial pathogens. AG toxicities include kidney tubular necrosis, vertigo, and, most notably, hearing loss. AG are used to treat multidrug-resistant tuberculosis (MDR-TB) and *Mycobacterium abscessus* complex (MABSC) infected patients (e.g. cystic fibrosis, bronchiectasis or chronic obstructive pulmonary disease). Studies have shown that 55-58% of patients infected with MDR-TB who received amikacin as part of their therapy, experienced hearing loss due to its ototoxic effects. Likewise, up to 27% of cystic fibrosis patients infected with *M. abscessus* who received AG therapy experienced hearing loss. Read more here: Research Project Leaders (creighton.edu)

Jeffery North, PhD

Stemm-Hear internships

Peter Steyger, Kalia Douglas-Micallef, Trinity Goodloe

The Dr. Richard J. Bellucci Translational Hearing Center was proud to welcome Kalia Douglas-Micallef from Dalhousie University in Nova Scotia and Trinity Goodloe from Case Western University in Ohio as part of the inaugural STEMM-HEAR summer research internship cohort. STEMM-HEAR is a NIH funded initiative started by Johns Hopkins University Professor Tilak Ratnanather, PhD to place undergraduate students with hearing loss in academic hearing research laboratories with mentors who also have hearing loss. In addition to Creighton and Johns Hopkins, Oregon Health & Science University, the University of Southern California, and Rice University hosted STEMM-HEAR interns.

The mentorship the interns receive from a faculty member with the shared experience of hearing loss is critical to the program. “In learning more about our condition, we find something fundamental about ourselves and why we are the way we are,” Dr. Peter Steyger said. This perspective was shared by the interns. “I want to bring my empathy and my experience into my research,” says Trinity, who’s majoring in psychology and communication sciences and disorders at Case Western. “Because I know this world, and I’m passionate about helping people who are dealing with some of the same challenges I have.” “For the first time in my life,” Kalia said, “I feel empowered to speak. I feel like I get to have a say and help find solutions for people like me.”

Working in Steyger’s lab has “shown us things — about our disabilities, about our lives — that we didn’t know were possible,” said Trinity. Peter was also impressed. “These students’ grift, perseverance, and enthusiasm,” he said, “reassure me that there will be many talented scientists who can carry on this torch.”

Bellucci Fellow Regina Gendzelevski Kelmann

Regina Gendzelevski Kelmann

Regina Gendzelevski Kelmann is the Dr. Richard J. Bellucci Postdoctoral Fellow. She began her career in pharmaceutical sciences, focused on drug delivery, but, after earning her doctorate and working as a professor in her native Brazil, she decided to pursue a postdoctoral role and focus on biomedical research. She came to Creighton as a postdoc in 2022 and joined the Steyger Lab in 2023 where she the impacts of Down syndrome on both the vestibular and hearing systems. This work is personal to her as her godson has Down Syndrome and she is "excited about the potential impact our research could have" for him and others.

Regina said Creighton was a natural fit for her. "At Creighton, I have the opportunity to work in a collaborative environment, and I feel fortunate to be part of the Bellucci Translational Hearing Center, which is dedicated to bridging basic research with clinical applications - exactly what I aim to do with my work."

More About Richard J. Bellucci, MD

Dr. Bellucci's mission in starting the Bellucci DePaoli Family Foundation was to ensure the important work of hearing preservation and restoration continues. The Foundation offers funding to impressive PhD candidates and post-doctoral fellows making important contributions in auditory research, plus support for acquiring necessary research equipment. During the procedure, the stapes (a tiny bone in the ear) is removed and replaced by a prosthetic device, gifting patients with certain types of hearing loss to regain their hearing. Dr. Bellucci was Chair of Otolaryngology at the Manhattan Eye, Ear & Throat Hospital (1963-79) and Chairman of Otolaryngology at New York Medical College (1966-80), completing his residency at the former. He trained many ear, nose, and throat specialists who practice today throughout the United States, Canada, and beyond. Dr. Bellucci was also the Director of several impressive residency programs. In addition to running his own private practice and serving as a longtime president of the American Otological Society, he volunteered time and services in his later years at the Hopital de Sacre Coeur in Milot, Haiti, exemplifying the Jesuit spirit of service.

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