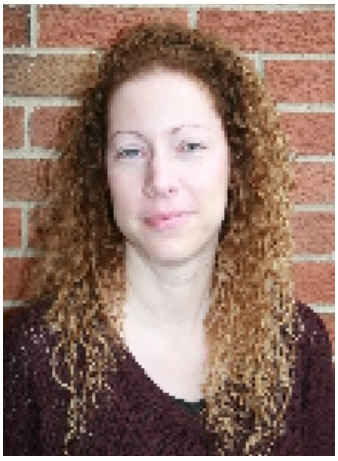
Hyperacusis Research
A nonprofit dedicated to stopping noise-induced pain

Donor Newsletter Volume 5, Winter 2017-18

2017 Emerging Research Grants

Along with our partner, the Hearing Health Foundation, we announced two grants in 2017. These grants will help uncover the mechanisms associated with hyperacusis on our path to a cure. We are grateful for the donor support that makes these grants possible.

Grant 1: *Homeostatic modifications in cortical GABA circuits enable states of hyperexcitability and reduced sound level tolerance after auditory nerve degeneration*



Jennifer Resnik, Ph.D.

Postdoctoral Fellow, Massachusetts Eye and Ear Infirmary and Harvard Medical School

Hyperacusis is emerging as a complex disorder. While it can be triggered by a peripheral ear injury, it develops from a maladaptation of the central auditory system to a peripheral dysfunction such as hearing loss. Jennifer's research will test the hypothesis that the recovery of sound detection and speech comprehension may cause an overcompensation that leads to an increase in sound sensitivity and reduced tolerance to sounds.

Long-Term Goal: To better understand the paradoxical role of central auditory system plasticity as both the cause of—and treatment for—the perceptual consequences of hearing loss. A major step to reach this goal is to understand the compensatory mechanisms, following cochlear damage, that allow for basic sound recovery while potentially introducing hypersensitivity and causing chronic sensory impairments such as hyperacusis.

Grant 2: *Behavior Model of Loudness Intolerance*

Senthilvelan Manohar, Ph.D.

Postdoctoral Fellow, University at Buffalo

One of the critical requirements for understanding and finding a cure for hyperacusis is the development of animal models. Two new behavior models will study the pain and annoyance components of hyperacusis: the Active Sound Avoidance Paradigm (ASAP), which uses a rodent's innate aversion to a light open area and preference for a dark enclosed box, and the Auditory Nociception Test (ANT), which is based on a traditional pain threshold assessment.

Using these tests together will enable assessment of reactions to sound as well as the neural interactions between auditory perception and pain sensation.

Long-Term Goal: To develop and establish a reliable behavioral model to understand the pain and annoyance aspects of hyperacusis and to use these behavioral models to identify the neural and molecular mechanisms underlying hyperacusis and tinnitus.

Cure4Cindy

One evening a year ago, Cindy Redmond was at a friend's house, sitting at the kitchen table. Her friend's stepfather, annoyed that Cindy was chatting on her phone, blasted her with an air horn.

Cindy, now 14, felt a burst of pain in her ears. Within days, she could no longer attend school because many noises there, including teachers' voices and cafeteria clatter, were amplified, loud, and painful. To Cindy, all but the mildest noise feels like a knife stabbing her ear. She also suffers from constant burning ear pain. No available treatment has helped Cindy.

Hyperacusis Research created a short video documenting Cindy's situation, which is viewable at Cure4Cindy.org. Cindy's story was featured in People Magazine online and other media.

University of Iowa Conference

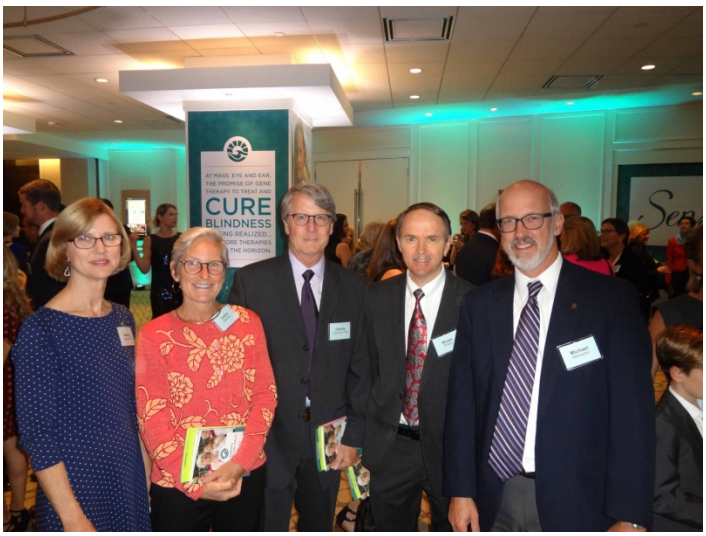
Hyperacusis Research president Bryan Pollard spoke to doctors and audiologists at the University of Iowa's 25th Annual International Conference on the Management of the Tinnitus & Hyperacusis Patient. The topic of Bryan's talk was "What's life really like with hyperacusis?" He focused on three areas:

- The Patient's Reality. Bryan told the story of a hyperacusis sufferer who tried many approaches to improve, including Tinnitus Retraining Therapy and round window reinforcement surgery, but without success.
- The Patient's Visit. Bryan described the patient's perspective with a typical visit to an audiologist, filled with noise hazards that healthy people would never consider, such as noisy waiting rooms, squeaky doors, loud speaking voices and even audiological testing that puts noises directly into a vulnerable ear.
- The Patient's Future. Bryan discussed some key findings from the Sanford CoRDS hyperacusis survey relating to pain and setbacks. 66 percent of patients experience continuous or daily pain, which results largely from new noise exposures.

Hyperacusis Highlighted at Massachusetts Eye & Ear Gala

Bryan attended the 8th annual Sense-ation! Gala fundraiser for Massachusetts Eye and Ear Infirmary (MEEI). More than 500 people attended the event, including the governor of Massachusetts.

Only one condition was highlighted as a new area of focus – hyperacusis. A video featured the story of Tom Maholchic, who suffers from severe hyperacusis due to noise overexposure. His parents, Michael and Betsy Maholchic, took the stage to describe what life at home has been like and why research is needed to find a cure.



Betsy Maholchic, Leslie and Charlie Liberman, Bryan Pollard, and Michael Maholchic at the Massachusetts Eye and Ear fundraising gala.

Hyperacusis Research also thanks Charlie Liberman, Otology Professor, Harvard Medical School, Massachusetts Eye and Ear Infirmary, who was instrumental in this focus on hyperacusis.

Further Achievements in 2017

2017 was an incredible year! Research collaboration activities accelerated at an exciting pace. New conferences provided opportunities to help others learn about hyperacusis and enabled us to learn from the most advanced medical research efforts. New public awareness efforts opened many doors for increasing the visibility of hyperacusis.

The cornerstone of our collaborative work with researchers continued at the 2017 Association for Research in Otolaryngology (ARO) Midwinter Meeting in Baltimore, Maryland. Our roundtable meeting, which included 41 attendees, focused on defining key next research steps to find a cure for hyperacusis. Several members of the National Institutes of Health attended the event.

At ARO, we announced the formation of the Hyperacusis Alliance, which provides a platform to continue collaboration throughout the year. We held four online meetings, which reviewed all current hyperacusis research projects.

Bryan Pollard at ARO with Katie Turner and Matthew Richardson of the Center for Hearing Research at the University of California, Irvine.

While serving on the board of the American Tinnitus Association, Bryan was excited to see the ATA fund a hyperacusis grant this year. The grant, for "A New Approach to Diagnosing Hyperacusis in Tinnitus Patients," is led by Sarah Theodoroff, Ph.D., of the National Center for Rehabilitative Auditory Research, VA Portland Healthcare System.

Bryan participated in the Partnering for Cures conference in Boston. Sponsored by FasterCures, the event addresses the most critical challenges in driving patient-focused medical solutions, especially for rare disorders. This provided an opportunity to network with leading medical nonprofits such as the Michael J. Fox Foundation to learn how to drive breakthroughs in research.

Bryan Pollard at Partnering for Cures with Sohini Chowdhury of the Michael J. Fox Foundation.

The 3rd annual Boston Benefit Dinner was a tremendous success! Together, we raised more than $17,000 for research to find a cure for hyperacusis.

Bryan presented at the British Society of Audiology's Global Brilliancy 2017 e-conference. The session, titled "Hyperacusis: What You Don't Know Can Hurt You (or Your Patient)," has been viewed by more than 260 people and emphasized the ease of worsening with new noise exposures.

Research progress has continued throughout the year. This was evident as Bryan visited the Polley Lab at Massachusetts Eye and Ear, where five researchers (including Jennifer Resnik, a grant recipient) described important efforts to uncover the mechanisms of hyperacusis.

Most importantly, your incredible support has made all this possible! Together we will find a cure for hyperacusis. Thank you!

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Hyperacusis Research is a 501(c)(3) non-profit organization devoted to finding a cure for hyperacusis by accelerating research for novel treatment therapies and by connecting patients to researchers. Contributions are fully tax-deductible as allowed by law and are gratefully welcomed by credit card online at www.hyperacusisresearch.org or by check to our mailing address above.

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