LAUER TINNITUS RESEARCH CENTER
In partnership with the Lauer Family, Mass. Eye and Ear launched the Lauer Tinnitus Research Center in 2014 with the goal of advancing research to better understand and treat the debilitating condition of tinnitus.

What is Tinnitus?
Tinnitus, or “ringing in the ears,” affects more than 50 million Americans. It refers to the perception of sound when no external sound is present. It can affect one or both ears, and the sound can vary in volume and tone (from a buzz or hiss to a roar). While many patients are able to cope with their tinnitus through masking and other techniques, for some patients, the condition can be so disturbing that they find it difficult to work, sleep and manage daily functions, often resulting in depression and isolation. Despite the magnitude of the problem of tinnitus, there are no scientifically proven treatments for the condition. Physicians can educate patients about tinnitus, but they have no established treatments to offer, leaving both patients and physicians frustrated.

The Ear-Brain Connection
Tinnitus is caused by hyperactivity in auditory processing centers of the brain. In most cases, hyperactivity in the brain is triggered by damage to delicate hair cells and nerve endings in the inner ear, though tinnitus can also be triggered by nerve damage in the face, neck or shoulder. When nerves are damaged, signals transmitted to the brain are lost or distorted. Nerve cells in the brain attempt to compensate for the drop in signal strength by making themselves hypersensitive. For some people, this hyperactivity can cause the perception of phantom sounds. If we can discover ways to turn down hyperactivity in the brain, we might be able to silence tinnitus. If we can discover ways to visualize and repair nerve damage in the inner ear, we might be able to silence tinnitus. Therefore, to understand tinnitus, we must study both the ear and the brain.

Research Approaches
The Lauer Tinnitus Research Center resides within Mass. Eye and Ear’s Eaton-Peabody Laboratories, the world’s largest hearing research enterprise, bringing years of experience and state-of-the-art research techniques to bear on the problem of tinnitus.
• Hidden Hearing Loss and Tinnitus – In 2009, Drs. Charles Liberman and Sharon Kujawa discovered that even brief exposure to loud noise can result in permanent loss of auditory nerve fibers. This condition is called “hidden hearing loss” because it does not affect the audiogram, however, it likely causes difficulty understanding speech in noisy environments and is believed to cause tinnitus. Dr. Liberman and his colleagues are working on therapeutic approaches to regrow these sensory neurons in hopes of restoring hearing function and alleviating tinnitus.

• Imaging the Inner Ear in Tinnitus – Dr. Konstantina Stankovic is pioneering the development of a new technology to non-invasively image the tiny sensory cells of the human inner ear. Because the inner ear is encased in the hardest bone in the body, no current imaging techniques can “see” the cells and neurons of the ear. Her research aims to develop an endoscope to be used in the exam room to assess neuronal survival in the inner ear, a key to diagnosing the cause of tinnitus.

• Tinnitus in the Brain – Dr. Daniel Polley, a leading expert in the physiology and plasticity of auditory processing areas of the brain, is using cutting edge technologies to study tinnitus in the brain. By imaging at a cellular level, he is assessing changes in patterns of neural activity that represent the underlying signature of tinnitus in mouse models. His research also investigates new strategies for direct brain stimulation and behavioral training that might reverse pathological patterns of activity and restore more normal sound perception in persons with tinnitus.

• Testing Tinnitus Strategies in Humans – Mass. Eye and Ear physicians and scientists are working together to begin clinical trials to objectively test potential treatments to mitigate tinnitus in humans. Their first target will be testing of a new hearing aid technology in patients with tinnitus who also have a high frequency hearing loss.

How You Can Help
We invite you to join Mass. Eye and Ear in aggressively pursuing prevention and treatment of tinnitus. Charitable gifts of all sizes will make an important difference. If you would like to learn more about how you can help, please contact Melissa Paul, Chief Development Officer at (617) 573-4168 or Melissa_Paul@meei.harvard.edu or make a gift at www.MassEyeAndEar.org/donations.

Yes, I want to support tinnitus research at Mass. Eye and Ear with a gift of:

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