Technology aims to remodel neural pathways that cause ringing in ears

More than 50 million people in the United States suffer from tinnitus—described as ringing in the ears—with the worst symptoms occurring in about 10 percent of sufferers. Unfortunately, current therapies in the clinic are minimally effective and do not directly treat the underlying causes of tinnitus.

The Solution

A University of Michigan team led by Susan Shore, Ph.D., has developed the Michigan Tinnitus Device, a novel technology that alleviates tinnitus through a sequence of auditory and somatosensory stimuli to the face or neck. The treatment utilizes a stimulus protocol consisting of precisely timed sounds alternated with weak electrical pulses that activate touch-sensitive nerves, aimed at steering damaged nerve cells back to normal activity.

The approach, called targeted bimodal auditory-somatosensory stimulation, shows promise and is currently being evaluated in a clinical trial.
Novel device provides relief from tinnitus

Significant Need
Some tinnitus cases are severe—some 6 million people cannot work or perform daily tasks because of the tinnitus or distress from the problem. Current therapies in the clinic have not definitively been shown to reduce tinnitus loudness or treat the underlying cause.

Compelling Science
By combining auditory stimuli at the tinnitus frequencies with precisely timed somatosensory stimuli to the neck or face, the Michigan Tinnitus Device suppresses the tinnitus-generating neurons that cause ringing in the ears. Early results in pre-clinical models of tinnitus indicate this combination is very effective in reducing the severity of the disease.

Competitive Advantage
Most current treatments focus on improving a patient’s quality of life by reducing their negative reactions to their tinnitus but not reducing the tinnitus loudness. By addressing the underlying cause of tinnitus, the Michigan Tinnitus Device will transform clinical practice by offering a science-based treatment targeting long-term plasticity in the brain.

MTRAC Project Key Milestones

- Current prototype designs will be enhanced to minimize development challenges and cost overruns.
- Device will undergo validation and verification testing.
- The Shore Lab will develop the software system for treatment management and data collection in collaboration with a local medical device developer.

Overall Commercialization

- Intellectual Property: Patents have been granted in the US, Canada, Europe and Japan and additional patents are being explored.
- Commercialization Strategy: Form a company; create a patient-paid model with consumer financing.
- Regulatory Pathway: Presubmission to FDA complete with feedback for path forward for DeNovo device.
- Product Launch Strategy: To be determined by licensee.