

NEWS

Dr Sanjay Agrawal develops breakthrough tinnitus treatment targeting brain pathways

September 01, 2026

Scientific researcher Dr Sanjay Agrawal, who holds 42 patents for unique drug formulations, has developed a novel treatment aimed at alleviating tinnitus—a condition that affects nearly 15% of the global population.

The Ahmedabad-based leading pharmaceutical consultant and inventor stated that the new formulation is designed to address the neuroplastic changes and emotional amplification mechanisms that underlie tinnitus. By targeting both peripheral damage and central compensation, it holds promise for reducing the phantom sound perception and associated distress.

Tinnitus is the perception of sound—such as ringing, buzzing, or clicking—in the absence of an external auditory stimulus. It can affect one or both ears and may be intermittent or constant. Chronic tinnitus, lasting more than six months, impacts 1–2% of individuals with significant emotional and functional distress. The condition is typically categorized into subjective tinnitus (heard only by the patient) and the rarer objective tinnitus (audible to an examiner).

Key risk factors include age-related and noise-induced hearing loss, ototoxic medications (e.g., aminoglycosides, NSAIDs, chemotherapy agents), ear infections, TMJ disorders, cardiovascular diseases, psychological conditions such as anxiety, depression, and stress.

Tinnitus often stems from cochlear damage and loss of sensory hair cells, leading to reduced auditory input. The brain compensates through neuroplastic changes, increasing spontaneous activity in the auditory cortex. Emotional and attentional centres like the limbic system and prefrontal cortex further amplify the distress.

Current pharmacological treatments focus on managing associated symptoms rather than eliminating tinnitus itself. Antidepressants like amitriptyline and nortriptyline, SSRIs, benzodiazepines (clonazepam, alprazolam), anticonvulsants (gabapentin, carbamazepine), melatonin, and zinc supplementation have all been explored, though most are used off-label and show variable efficacy.

Non-drug interventions are increasingly favored. Cognitive Behavioral Therapy (CBT), Tinnitus Retraining Therapy (TRT), sound therapy, hearing aids, mindfulness, relaxation techniques, and repetitive transcranial magnetic stimulation (rTMS) are among the most effective strategies for reducing perception and improving quality of life.

International health bodies advocate a multidisciplinary, patient-centred approach. CBT, sound therapy, and education are recommended as first-line treatments, while routine pharmacological intervention is discouraged. Guidelines from the American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS), the UK's NICE, and European associations emphasize early diagnosis and psychological support. The World Health Organization (WHO) also underscores prevention through noise control and cautious use of ototoxic drugs.

Dr Agrawal's formulation aligns with global efforts to move beyond symptomatic relief toward targeted neurological intervention. By addressing both the auditory and emotional pathways involved in tinnitus, the innovation could mark a significant advancement in treatment options for millions affected worldwide.



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