

# Music to your ears



Senior research fellow Dr Andrew Wise is one of the scientists behind the nanoparticle research. Picture: JAY TOWN

## New preclinical trials offer glimmer of hope for deafness sufferers

**BRIGID O'CONNELL**

TINY particles that deliver drugs to the hard-to-reach inner ear have been developed by Melbourne researchers in an ambitious project to develop the first preventive treatment for the most common type of deafness.

A team from the Bionics Institute and University of Melbourne has developed porous particles — about the size of Hundreds & Thousands — that are loaded with medication and delivered through the ear drum and into the cochlear, to protect the easily damaged sensory hair cells that convert sound into nerve impulses.

Preclinical studies have shown that delivering these growth factors into the inner ear can restore the loss of connections between neurons and sensory cells — just like reconnecting the lead cable to a microphone.

Now, a \$680,000 National Health and Medical Research Council grant will fund the crucial final preclinical studies aiming to test whether the treatment delivers functional

benefit, in order for a first trial in humans.

Senior research fellow Dr Andrew Wise said hearing aids and cochlear implants were the only treatments for sensorineural hearing loss, which affects the volume and clarity of sound, and makes discriminating words from background noise hard.

But given hearing aids only amplify sound and don't make words clearer, and that a third of cochlear patients inexplicably lose their remaining natural hearing, better treatments were needed.

"It's known as 'hidden hearing loss', because it's not reliably detectable," Dr Wise said.

"And yet, it's severe hearing loss that's an important factor in the progression of neurological diseases like dementia."

Dr Wise said their drug delivery technique helped overcome two major challenges of delivering medication to the

inner ear: firstly, protecting the medication so it could diffuse over weeks or months; and secondly, by allowing the drug to stay close to sensory cells rather than being drained through the tubes connected to the throat.

"It's about finding that early therapy so you can go in, repair and regenerate those connections, when it hasn't progressed to such a degenerative state," Dr Wise said.

"Once you lose those hair cells at the moment there is no way to replace them. But if we can repair some links, you can perhaps slow progression and improve hearing."

ENT surgeon Sheryl Wagstaff, a co-investigator on the project, said she had seen how hearing loss quickly lead to social isolation, which increased the risk of dementia.

"I used to say to patients; there's not going to be anything I can do for you in my lifetime. Just recently I've been saying; there might be something on the horizon," she said.

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