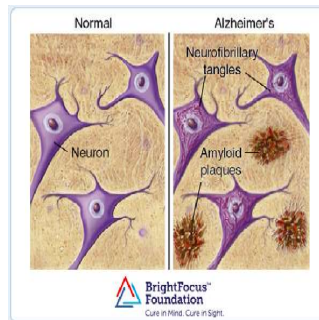


Noninvasive Ultrasound Technology Could Treat Alzheimer's Disease



Researchers at the University of Queensland (Australia) have found that noninvasive ultrasound technology can be used to treat Alzheimer's disease and restore memory. In a report published in the journal *Science Translational Medicine*, the researchers say the innovative drug-free approach breaks apart the neurotoxic amyloid plaques that result in memory loss and cognitive decline.

The new treatment method could revolutionise Alzheimer's treatment by restoring memory, according to Professor Jürgen Götz, director of Queensland Brain Institute's Clem Jones Centre for Ageing Dementia Research. "We're extremely excited by this innovation of treating Alzheimer's without using drug therapeutics."

The ultrasound waves oscillate tremendously quickly, activating microglial cells that digest and remove the amyloid plaques that destroy brain synapses, Professor Götz explains. "The word 'breakthrough' is often misused, but in this case I think this really does fundamentally change our understanding of how to treat this disease, and I foresee a great future for this approach."

The approach is able to temporarily open the blood-brain barrier, activating mechanisms that clear toxic protein clumps and restoring memory functions. "With our approach the blood-brain barrier's opening is only temporary for a few hours, so it quickly restores its protective role," Professor Götz points out.

Research has been conducted using mice with an Alzheimer's model, with the next step being to scale the research in higher animal models ahead of human clinical trials, which are at least two years away. "This treatment restored memory function to the same level of normal healthy mice," says Professor Götz.

Alzheimer's disease affects more than two-thirds of dementia patients, and about a quarter of a million Australians. The total number of dementia cases in Australia is expected to increase to 900,000 by 2050.

"With an ageing population placing an increasing burden on the health system, an important factor is cost, and other potential drug treatments using antibodies will be expensive," Professor Götz notes. "In contrast, this method uses relatively inexpensive ultrasound and microbubble technology which is non-invasive and appears highly effective."

The discovery was made possible through the support of the State and Federal Governments and philanthropic support led by the Clem Jones Foundation.

"The farsighted investment of government and philanthropic partners has allowed us to build the research excellence and capacity required to make major discoveries such as this," says Queensland Brain Institute Founding Director Professor Perry Bartlett. "I believe the work opens up an entirely novel avenue for future therapeutic treatment."

Professor Götz adds, "We're also working on seeing whether this method clears toxic protein aggregates in neurodegenerative diseases other than Alzheimer's and whether this also restores executive functions, including decision-making and motor control."

Source: [Queensland Brain Institute](#)
Image Credit: Case Western Reserve University

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