NEUROLOGICAL HEALTH

An Hour of Light and Sound a Day Might Keep Alzheimer's at Bay

Playing a flashing white light and a trilling sound reversed signs of Alzheimer's in mice. Researchers are now trying it in humans

By Angus Chen on March 14, 2019

Credit: Getty Images

There is no cure for Alzheimer's disease. Although a few drugs manage temporarily certain cognitive symptoms of the illness, none can stop or meaningfully slow its progression. "We really don't have much to offer people," says Shannon Macauley, a neuros tually all new treatments have failed i ond drugs to see what relief might come f

Bathin oth tuned to a frequency of 40 hertz n in, according to a paper published in *Cell* ing paper to be honest," says Macau ry provocative idea. It's noninv were to come to fruition in humar

In 2015 neuroscientist Li-Huei Tsai, director at The Picower Institute for Learning and Memory at Massachusetts Institute of Technology, was working on an experiment to manipulate that brain activity by flashing a white light at these mice. Like light strobes, our bra ge groups of neurons oscillate on and off tions and senses in this rhythmic electric 40 times a second, or 40 hertz, and fli —generating gamma waves at a corresp happened.

When ' nount of amyloid plaques and tau tangles "It was the most remarkable thing," a tremendous microglia respon r cell debris and toxic waste includi sease, but [the light] seems to

centers of the brain. And there was about a 40 or 50 percent decrease in amyloid and tau levels. It's an absolutely impressive feat."

That showed when Tsai put the mice through a set of cognitive tests. In one, where the mice were given a familiar and an unfamiliar object to explore, mice that didn't get the treatment acted as though they'd never seen the familiar object. "That shows some memory problems," Tsai says. Mice that saw the light and heard the sound spent about two thirds of the time that untreated mice did examining the familiar object. "It was unbelievable," Tsai says. "This is the first time we've seen that this noninvasive stimulation can improve cognitive function. It's not a drug or an antibody or anything, it's just light and sound."

One possible explanation for this is brains with Alzheimer's have irregular, often hyperactive, neurons, says Jorge Palop, a neurologist at the University of California, San Franci g the brains with a steady and regula as a kind of metronome for brain activity y and correcting some of this abnorr nstream of that are all these benefi

All of this is still at the level of speculation. Researchers simply do not know why these brain waves, specifically ones rising from light and sound stimulation at 40 hertz and no other frequencies, can lead to a reversal of Alzheimer's disease symptoms. "That's a mystery," says Terrence Town, a neuroscientist, at the University of Southern California who was not involved with the work. It's also not clear if these beneficial effects would appear or if 40 hertz is the "magic" frequency in humans, he says.

Tsai is already working on answering those questions. In human studies underway at Cognit colleague Ed Boyden, she says light a lthy participants without negative side ef t it," Tsai says. "But to see a [therap ng time. If this approach has an impact ave some conclusive answer."

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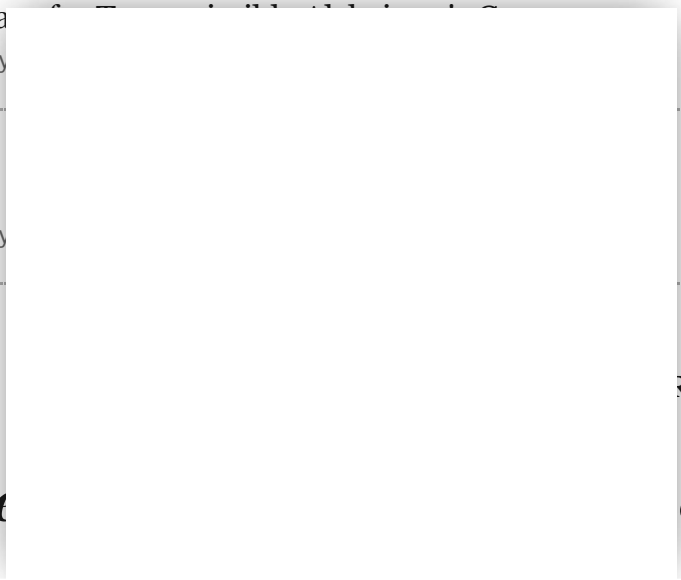

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