

Reversing Alzheimer's memory loss may be possible

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Mental stimulation and drug treatment may help people with brain ailments such as Alzheimer's disease regain seemingly lost memories, according to research published on Sunday.

Scientists used two methods to reverse memory loss in mice with a condition like Alzheimer's -- placing them in sort of a rodent Disneyland to stimulate their brains, and also using a type of drug that encourages growth of brain nerve cells.

Neuroscientist Li-Huei Tsai of the Howard Hughes Medical Institute and the Massachusetts Institute of Technology said such methods might yield similar benefits in people with Alzheimer's disease or other types of dementia that rob them of their memory and ability to learn.

"We show, I believe, the first evidence that even if the brain suffered some very severe neurodegeneration and the individual exhibits very severe learning impairment and memory loss, there is still the possibility to improve learning ability and recover to a certain extent lost long-term memories," Tsai said in a telephone interview.

Tsai said if apparently lost long-term memories could be retrieved, this suggested the memories had not been actually erased from the brain.

Instead, she and colleagues reported in the journal *Nature*, the memories probably remained in storage but could not be accessed or retrieved due to the brain damage.

The researchers used genetically engineered elderly mice in which they were able to activate a protein that triggered brain pathology very much like that of people with Alzheimer's, with atrophy and loss of nerve cells.

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Previous research has shown that regular mental stimulation such as reading or playing a musical instrument may reduce one's risk for Alzheimer's. And a stimulating environment also has been shown to improve learning in mice.

In one part of their study, the researchers took mice out of their usual bland cages and placed them in a sort of mouse playground loaded with an ever-changing assortment of colorful toys, treadmills and other mice.

The researchers previously had used a "fear-conditioning" test -- placing mice in a chamber and delivering a mild electric shock to their feet -- to establish an enduring memory.

Mice with Alzheimer's-like brain damage put in the stimulating environment could remember that shock test far better than similar animals kept in standard cages. The playground mice also were better at learning new things than those kept in standard cages.

After exploring the biological mechanism behind the improvement in mice placed in the enriched environment, the researchers tested on the mice a class of drugs called histone deacetylase, or HDAC, inhibitors.

Memory and learning improved in the mice, similar to improvements caused by environmental stimulation, the researchers said. They said this indicated such drugs represent a

potential way to treat people with conditions like Alzheimer's.

Tsai said most current treatments for Alzheimer's were intended to affect the disease's early stages before profound memory loss occurred, but this research showed that even after major brain damage had occurred it was still possible to improve learning and memory.