Experimental therapy eases Alzheimer's signs, symptoms in mice

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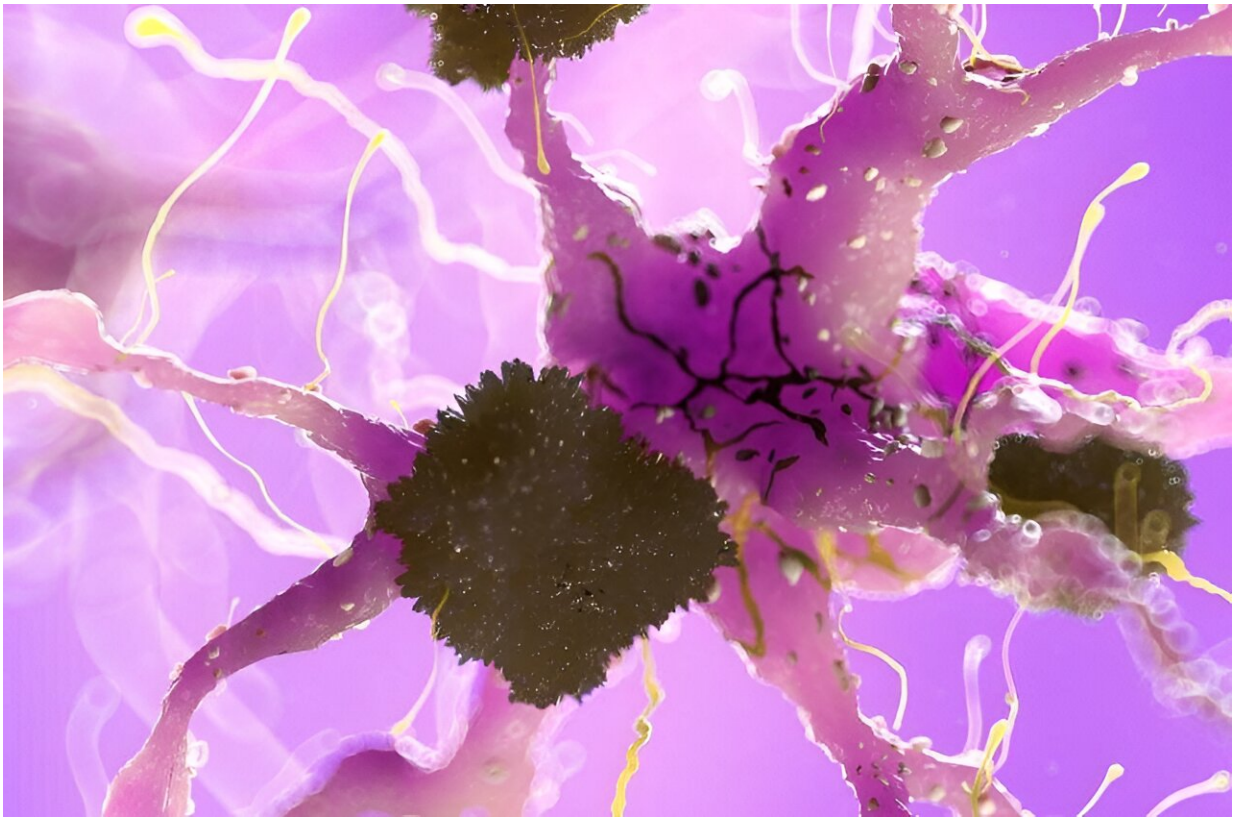

A new cellular therapy improved learning and memory in mice with Alzheimer's disease, researchers report.

The therapy—developed at the University of Nebraska Medical Center (UNMC)—relies on both the immune system to fight key aspects of Alzheimer's, plus modified cells that zero in on the brain protein plaques that are a hallmark of the disease.

In patients with Alzheimer's, amyloid-beta protein forms plaques that prevent nerve cells from signaling each other. One theory is that this might cause irreversible memory loss and behavior changes characteristic of Alzheimer's disease.

The new study was recently published in the journal *Molecular Neurodegeneration*. Researchers used genetically modified immune-controlling cells called Tregs to target amyloid-beta.

When the UNMC team injected the modified Treg cells into the bloodstreams of mice, buildup of plaque and brain inflammation slowed. Thinking skills also appeared to improve in the diseased mice.

While the results of animal studies often turn out differently in humans, researchers were encouraged by the findings.

"The study is an important development in the field that advances the possibility of using cell-based therapies for targeting protein aggregates in neurodegenerative diseases," said senior investigator Dr. Avindra Nath, of the National Institutes of Health, which funded the study.

Researchers said the engineered immune cells could offer a targeted and more effective treatment for Alzheimer's, a disease affecting an estimated 6.7 million Americans.

Lead study author Pravin Yeapuri, a postdoctoral fellow at UNMC, noted that other recent clinical trials have also shown the benefit of using Treg cells in treating Alzheimer's and other degenerative brain diseases.

"But the limitation has been how to get protective cells into the regions of the brain most affected in Alzheimer's disease," he explained in a UNMC news release.

The next step will be testing this approach in humans. Those close to the study are optimistic.

"We look forward with great excitement to seeing where this important breakthrough may lead in the fight against Alzheimer's," said UNMC chancellor Dr. Jeffrey Gold.

More information: Pravin Yeapuri et al, Amyloid-β specific regulatory T cells attenuate Alzheimer's disease pathobiology in APP/PS1 mice, *Molecular Neurodegeneration* (2023). DOI: 10.1186/s13024-023-00692-7