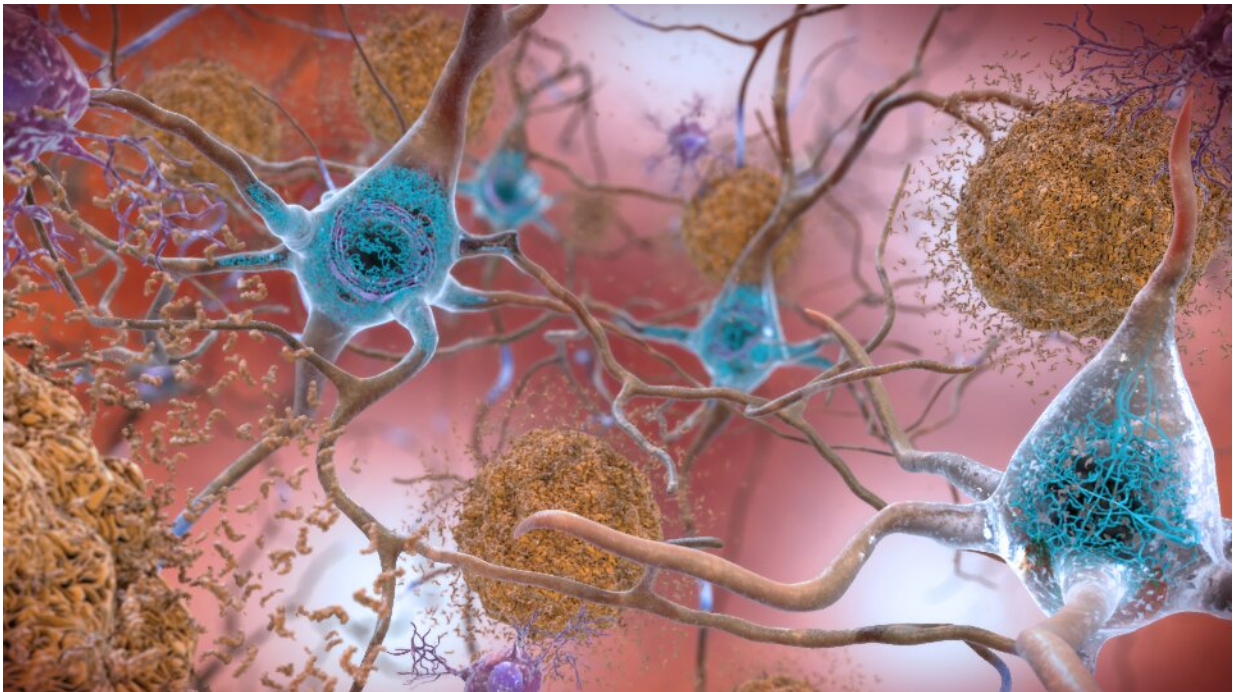


# Exercise could slow withering effects of Alzheimer's

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In the Alzheimer's affected brain, abnormal levels of the amyloid beta protein clump together to form plaques (seen in brown) that collect between neurons and disrupt cell function. A UT Southwestern study shows people with abnormal amyloid beta accumulation experienced slower brain degeneration if they exercised regularly for one year. Credit: National Institute on Aging, NIH

Exercising several times a week may delay brain deterioration in people at high risk for Alzheimer's disease, according to a study that scientists

say merits further research to establish whether fitness can affect the progression of dementia.

Research from UT Southwestern found that people who had accumulation of amyloid beta in the [brain](#)—a hallmark of Alzheimer's disease—experienced slower degeneration in a region of the brain crucial for memory if they exercised regularly for one year.

Although exercise did not prevent the eventual spread of toxic amyloid plaques blamed for killing neurons in the brains of dementia patients, the findings suggest an intriguing possibility that aerobic workouts can at least slow down the effects of the disease if intervention occurs in the early stages.

"What are you supposed to do if you have amyloid clumping together in the brain? Right now doctors can't prescribe anything," said Dr. Rong Zhang, who led the clinical trial that included 70 participants ages 55 and older. "If these findings can be replicated in a larger trial, then maybe one day doctors will be telling high-risk patients to start an exercise plan. In fact, there's no harm in doing so now."

## **Reduced brain atrophy**

The study published in the *Journal of Alzheimer's Disease* compared cognitive function and brain volume between two groups of sedentary older adults with memory issues: One group did aerobic exercise (at least a half-hour workout four to five times weekly), and another group did only flexibility training.

Both groups maintained similar cognitive abilities during the trial in areas such as memory and problem solving. But brain imaging showed that people from the exercise group who had amyloid buildup experienced slightly less volume reduction in their hippocampus—a

memory-related brain region that progressively deteriorates as dementia takes hold.

"It's interesting that the brains of participants with amyloid responded more to the aerobic exercise than the others," said Dr. Zhang, who conducted the trial at the Institute for Exercise and Environmental Medicine. "Although the interventions didn't stop the hippocampus from getting smaller, even slowing down the rate of atrophy through exercise could be an exciting revelation."

However, Dr. Zhang notes that more research is needed to determine how or if the reduced atrophy rate benefits cognition.



Dr. Rong Zhang, Neurologist at UT Southwestern's O'Donnell Brain Institute  
Credit: UTSW

## **Elusive answers**

The search for dementia therapies is becoming increasingly pressing: More than 5 million Americans have Alzheimer's disease, and the number is expected to triple by 2050.

Recent research has helped scientists gain a greater understanding of the molecular genesis of the disease, including a UT Southwestern discovery published last year that is guiding efforts to detect the condition before symptoms arise. Yet the billions of dollars spent on trying to prevent or slow dementia have yielded no proven treatments that would make an early diagnosis actionable for patients.

## **Fitness and brain health**

Dr. Zhang is among a group of scientists across the world trying to determine if exercise may be the first such therapy.

His latest research builds upon numerous studies suggesting links between fitness and brain health. For example, a 2018 study showed that people with lower fitness levels experienced faster deterioration of vital nerve fibers in the brain called white matter. Research in mice has similarly shown exercise correlated with slower deterioration of the hippocampus—findings that prompted Dr. Zhang to investigate whether the same effects could be found in people.

"I'm excited about the results, but only to a certain degree," Dr. Zhang said. "This is a proof-of-concept study, and we can't yet draw definitive conclusions."

## Expanded research

Dr. Zhang is leading a five-year national clinical trial that aims to dig deeper into potential correlations between [exercise](#) and dementia.

The trial, which includes six medical centers across the country, involves more than 600 older adults (ages 60-85) at high risk of developing Alzheimer's disease. The study will measure whether [aerobic exercise](#) and taking specific medications to reduce high blood pressure and cholesterol can help preserve brain volume and cognitive abilities.

"Understanding the molecular basis for Alzheimer's disease is important," Dr. Zhang said. "But the burning question in my field is, 'Can we translate our growing knowledge of molecular biology into an effective treatment?' We need to keep looking for answers."

Provided by UT Southwestern Medical Center

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