

# Diabetes drug 'significantly reverses memory loss' in mice with Alzheimer's

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One in three people will be diagnosed with Alzheimer's. Credit: Lancaster University

A drug developed for diabetes could be used to treat Alzheimer's after scientists found it "significantly reversed memory loss" in mice through a triple method of action.

The research, published in *Brain Research*, could bring substantial improvements in the treatment of Alzheimer's disease through the use of a [drug](#) originally created to treat type 2 diabetes.

Lead researcher Professor Christian Holscher of Lancaster University in the UK said the novel treatment "holds clear promise of being developed into a new treatment for chronic neurodegenerative disorders such as Alzheimer's disease."

Alzheimer's disease is the most common cause of dementia and the numbers are expected to rise to two million people in the UK by 2051 according to Alzheimer's Society, who part-funded the research.

Dr Doug Brown, Director of Research and Development at Alzheimer's Society, said: ""With no new treatments in nearly 15 years, we need to find new ways of tackling Alzheimer's. It's imperative that we explore whether drugs developed to treat other conditions can benefit people with Alzheimer's and other forms of dementia. This approach to research could make it much quicker to get promising new drugs to the people who need them."

Although the benefits of these 'triple agonist' drugs have so far only been found in mice, other studies with existing [diabetes drugs](#) such as liraglutide have shown real promise for people with Alzheimer's, so further development of this work is crucial."

This is the first time that a triple receptor drug has been used which acts in multiple ways to protect the brain from degeneration. It combines GLP-1, GIP and Glucagon which are all growth factors. Problems with

growth factor signalling have been shown to be impaired in the brains of Alzheimer's patients.

The study used APP/PS1 mice, which are transgenic mice that express human mutated genes that cause Alzheimer's. Those genes have been found in people who have a form of Alzheimer's that can be inherited. Aged [transgenic mice](#) in the advanced stages of neurodegeneration were treated.

In a maze test, learning and memory formation were much improved by the drug which also:-

- enhanced levels of a brain growth factor which protects nerve cell functioning
- reduced the amount of amyloid plaques in the brain linked with Alzheimer's
- reduced both chronic inflammation and oxidative stress
- slowed down the rate of nerve cell loss

Professor Holscher said: "These very promising outcomes demonstrate the efficacy of these novel multiple receptor drugs that originally were developed to treat type 2 diabetes but have shown consistent neuro-protective effects in several studies."

"Clinical studies with an older version of this drug type already showed very promising results in people with Alzheimer's disease or with mood disorders"

"Here we show that a novel triple receptor drug shows promise as a potential treatment for Alzheimer's but further dose-response tests and direct comparisons with other drugs have to be conducted in order to evaluate if this [new drugs](#) is superior to previous ones."

Type 2 diabetes is a risk factor for Alzheimer's and has been implicated in the progression of the disease. Impaired insulin has been linked to cerebral degenerative processes in type 2 diabetes and Alzheimer's disease. Insulin desensitisation has also been observed in the Alzheimer's disease brain. The desensitisation could play a role in the development of neurodegenerative disorders as insulin is a [growth factor](#) with neuroprotective properties.

**More information:** Jingjing Tai et al, Neuroprotective effects of a triple GLP-1/GIP/glucagon receptor agonist in the APP/PS1 transgenic mouse model of Alzheimer's disease, *Brain Research* (2017). [DOI: 10.1016/j.brainres.2017.10.012](#)

Provided by Lancaster University

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