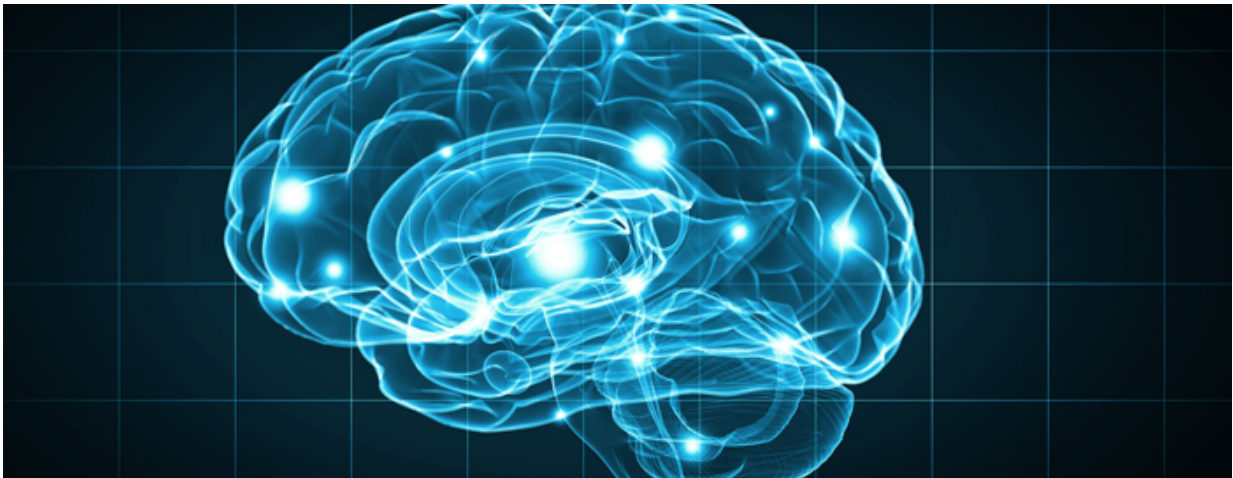


# Study offers new insight into how Alzheimer's disease begins

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Credit: University of Texas Medical Branch at Galveston

A new study from The University of Texas Medical Branch at Galveston offers important insight into how Alzheimer's disease begins within the brain. The researchers found a relationship between inflammation, a toxic protein and the onset of the disease. The study also identified a way that doctors can detect early signs of Alzheimer's by looking at the back of patients' eyes.

"Early detection of Alzheimer's warning signs would allow for early intervention and prevention of neurodegeneration before major brain cell loss and cognitive decline occurs," said lead author Ashley Nilson, a

neuroscience graduate student. "Using the retina for detecting AD and other neurodegenerative diseases would be non-invasive, inexpensive and could become a part of a normal screening done at patient checkups."

UTMB researchers have previously found evidence that a toxic form of tau protein may underlie the early stages of Alzheimer's. Brain cells depend on tau protein to form highways for the cell to receive nutrients and get rid of waste. In some neurodegenerative diseases like Alzheimer's, the [tau protein](#) changes into a toxic form called tau oligomers and begins clumping into neurofibrillary tangles. When this happens, molecular nutrients can no longer move to where they are needed and the oligomers produce toxic effects leading to the eventual death of the brain cells.

It's becoming increasingly clear that [inflammation](#) within the brain plays an important role in Alzheimer's development and progression. Inflammation and loss of connections between nerves within the brain happen before the formation of the tangles that are characteristic of this disease. It's possible that the tau oligomers may be responsible for this inflammation.

In a recent paper in the *Journal of Alzheimer's Disease*, UTMB's research team detailed their investigation on the relationship between inflammation, toxic tau and Alzheimer's onset by performing systematic analyses of brain and retina samples from people with Alzheimer's and a mouse model of Alzheimer's.

The results demonstrated that the toxic tau may induce inflammation in Alzheimer's. The toxic tau spreads between connected brain regions, which may initiate inflammation in these new regions. This situation can create a cycle of toxic tau, inflammation and cell death throughout the [brain](#) over time.

Beyond determining eye health and corrective lens prescriptions, having an eye exam can alert health care professionals of several different health conditions including diabetic complications, high cholesterol and high blood pressure. Now, UTMB researchers found that retina tissue that they studied can show evidence of toxic tau and inflammation.

"Our findings suggest that the degeneration of nerve cells due to [chronic inflammation](#) induced by the tau oligomers may be combated through the combination of anti-tau oligomer and anti-inflammatory therapeutics for the treatment of Alzheimer's and related diseases," said senior author Rakez Kaye, associate professor in the UTMB Department of Neurology. "Our is continuing to expand our understanding of [neurodegenerative diseases](#)."

Provided by University of Texas Medical Branch at Galveston

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