



Alzheimer's Disease: Brain Immune Cells May Offer New Treatment Target

Brain scans of people with Alzheimer's disease have revealed that the brain damage that accompanies forgetfulness and confusion becomes visible soon after tau tangles start fusing into a mass.

A recent *Journal of Experimental Medicine* paper explains how the microglia become active as the tau clumps begin to form.

The study authors also showed that eliminating microglia greatly reduced tau-related damage in the brains of mice genetically modified to develop protein tangles.

They suggest that the findings point to a new way to delay the dementia that tau-related brain damage causes in humans.

"If you could target microglia in some specific way and prevent them from causing damage," says senior study author David M. Holtzman, a professor of neurology at the Washington University School of Medicine in St. Louis, MO, "I think that would be a really important, strategic, novel way to develop a treatment."

Toxic protein and destruction of brain tissue

Alzheimer's is a condition that destroys brain tissue. Although scientists are not sure exactly how this common form of dementia arises, they have two prime suspects in their sights: tau and beta-amyloid protein.

Autopsy evidence has revealed that most people develop plaques of beta-amyloid and tau tangles with age. However, those with Alzheimer's disease seem to have many more of them. In addition, these proteins tend

to amass in a predictable pattern that begins in memory areas of the brain and then spreads.

In the healthy brain, tau protein supports the function of neurons, which are the nerve cells that make up the brain's communication system. The protein stabilizes microtubules, which are structures that help neurons transport molecules and nutrients.

However, tau protein can also behave abnormally and collect in toxic clumps that disrupt and kill neurons.

This occurs not only in Alzheimer's, but also in other progressive brain conditions such as chronic traumatic encephalopathy. This is a condition that often occurs in boxers and football players following repeated head injuries.

The new study concerns the role of microglia in the tau clumping process. Microglia are immune cells that reside in the central nervous system (CNS) and guide its growth, development, and function.

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