

Stimulating the brain's immune response may provide treatment for Alzheimer's disease

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A new target for the prevention of adverse immune responses identified as factors in the development of Alzheimer's disease (AD) has been discovered by researchers at the University of South Florida's Department of Psychiatry and the Center of Excellence for Aging and Brain Repair.

Their findings are published online in the *Journal of Neuroscience*.

The CD45 molecule is a receptor on the surface of the brain's microglia cells, cells that support the brain's [neurons](#) and also participate in brain immune responses.

Previous studies by the USF researchers showed that triggering CD45 was beneficial because it blocked a very early step in the development of Alzheimer's disease. In the present study, the researchers demonstrated in Alzheimer's mouse models that a loss of CD45 led to dramatically increased microglial inflammation.

Although the brain's [immune response](#) is involved in Alzheimer's disease pathology, "this finding suggests that CD45 on brain [immune cells](#) appears critically involved in dampening harmful inflammation," said study senior author Jun Tan, MD, PhD, a professor of psychiatry and Robert A. Silver chair at the Rashid Laboratory for Developmental Neurobiology, USF Silver Child Development Center and research

biologist for Research and Development Service at the James A. Haley Veteran's Hospital.

The investigators also found an increase in harmful [neurotoxins](#), such as A beta [peptides](#), as well as neuron loss in the brains of the test mice.

"In short, CD45 deficiency leads to increased accumulation of neurotoxic A beta in the brains of old Alzheimer's mice, demonstrating the involvement of CD45 in clearing those toxins and protecting neurons," Dr. Tan said. "These findings are quite significant, because many in the field have long considered CD45 to be an indicator of harmful [inflammation](#). So, researchers assumed that CD45 was part of the problem, not a potential protective factor."

The next step is to apply these findings to develop new Alzheimer's disease treatments, said Paula Bickford, PhD, a professor in the USF Department of Neurosurgery and senior career research scientist at the James A. Haley Veteran's Hospital.

"We are already working with Natura Therapeutics, Inc. to screen for natural compounds that will target CD45 activation in the brain's immune cells," Dr. Bickford said.

More information: <http://www.jneurosci.org/>

Provided by University of South Florida

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