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Drugs found to both prevent and treat Alzheimer's disease in mice

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Researchers at USC have found that a class of pharmaceuticals can both prevent and treat Alzheimer's Disease in mice.

The drugs, known as "TSPO ligands," are currently used for certain types of neuroimaging.

"We looked at the effects of TSPO ligand in young adult mice when pathology was at an early stage, and in aged mice when pathology was quite severe," said lead researcher Christian Pike of the USC Davis School of Gerontology. "TSPO ligand reduced measures of pathology and improved behavior at both ages."

The team's findings were published online by the *Journal of Neuroscience* on May 15. Pike's coauthors include USC postdoctoral scientists Anna M. Barron, Anusha Jayaraman and Joo-Won Lee; as well as Donatella Caruso and Roberto C. Melcangi of the University of Milan and Luis M. Garcia-Segura of the Instituto Cajal in Spain.

The most surprising finding for Pike and his team was the effect of TSPO ligand in the aged mice. Four treatments—once per week over four weeks—in older mice resulted in a significant decrease of Alzheimer's-related symptoms and improvements in memory – meaning that TSPO ligands may actually reverse some elements of Alzheimer's disease.

"Our data suggests the possibility of drugs that can prevent and treat

Alzheimer's," Pike said. "It's just mouse data, but extremely encouraging mouse data. There is a strong possibility that TSPO ligands similar to the ones used in our study could be evaluated for therapeutic efficacy in Alzheimer's patients within the next few years."

Next, the team will next focus on understanding how TSPO ligands reduce Alzheimer's disease pathology. Building on the established knowledge that TSPO ligands can reduce inflammation—shielding nerve cells from injury and increasing the production of neuroactive hormones in the brain—the team will study which of these actions is the most significant in fighting Alzheimer's disease so they can develop newer TSPO ligands accordingly.

Provided by University of Southern California