

Cholesterol drug shows benefit in animal study of Alzheimer's disease

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A cholesterol drug commonly prescribed to reduce cardiovascular disease risk restores blood vessel function in a mouse model of Alzheimer's disease, according to a study in the April 4 issue of *The Journal of Neuroscience*. The drug simvastatin (Zocor) — which works by slowing cholesterol production — also improves learning and memory in adult, but not aged Alzheimer's model mice. The findings add to a growing body of evidence that early treatment with statins protects against some of the symptoms of Alzheimer's disease.

Alzheimer's disease destroys nerve cells and compromises the function of [blood vessels](#) in the brain. Recent studies show people who begin taking statins as adults have reduced incidence of Alzheimer's disease, while those who do not take them until they are older do not experience this benefit. While these studies point to the age-dependent benefits of statins, scientists continue to question how [cholesterol](#) treatment affects brain function in Alzheimer's disease.

In a previous study, Edith Hamel, PhD, and colleagues at McGill University tested older Alzheimer's model mice (age twelve months) that received a low dose of [simvastatin](#) for eight weeks. The drug helped improve blood vessel function, but did not boost memory in the older mice.

In the new study, Hamel's group tested younger mice (age six months) and older mice (age twelve months) that received a higher dose of simvastatin for three to six months. While simvastatin restored brain

blood vessel function in both groups, only the younger mice showed improvements in learning and memory tests. These younger mice also had higher levels of two memory-related proteins in the hippocampus — a brain region involved in learning and memory — compared with untreated mice.

"This study shows that simvastatin can protect against some of the damaging effects of Alzheimer's disease on nerve cells involved in memory, if administered early in the disease process," said Hamel, the study's senior author.

In people with Alzheimer's disease, protein fragments called amyloid- β (A β) form plaques between nerve cells that disrupt cell communication. Normally, these protein fragments are broken down and removed. In Alzheimer's disease, the protein fragments clump together — a factor believed to contribute to memory loss. Hamel's team measured the presence of A β proteins in younger and older Alzheimer's model mice that received simvastatin. Despite the learning and memory improvements in younger mice, the drug did not reduce A β protein levels in either group.

"This article joins an increasing number of preclinical studies demonstrating that statins, in particular simvastatin — which easily penetrates the brain — can counteract some aspects of Alzheimer's disease, despite seeing no effects on amyloid- β protein," said Ling Li, PhD, an Alzheimer's expert from the University of Minnesota.

"Although several clinical trials have yet to show the benefits of statins for Alzheimer's disease, the key now is to figure out how to translate these exciting findings from bench to bedside," she added.

Provided by Society for Neuroscience

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