# Inflammation may trigger Alzheimer's disease

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The anti-inflammatory drug indomethacin could hold promise as a treatment for Alzheimer's disease, says a Saint Louis University doctor and researcher.

Two research studies published by William A. Banks, M.D., professor of geriatrics and pharmacological and physiological science at Saint Louis University School of Medicine, support this conclusion and offer what he calls a "one-two punch" in giving clues on how Alzheimer's disease develops and could be treated.

His study in the July edition of the *Journal of Alzheimer's Disease* supports the idea that toxic levels of amyloid beta protein, the substance scientists believe is responsible for Alzheimer's disease, accumulate in the brain because a pump that pushes it into the blood and past the blood-brain barrier malfunctions.

The blood-brain barrier is a system of cells that regulates the exchange of substances between the brain and the blood. The blood-brain barrier transporter known as LRP is the pump that removes amyloid beta protein from the brain and into the bloodstream.

"LRP malfunctions like a stop light stuck on red, and keeps amyloid beta protein trapped in the brain," said Banks, who also is a staff physician at Veterans Affairs Medical Center in St. Louis.

He tested the hypothesis by giving mice an antisense, which is a

molecular compound that blocked the production of LRP. Amyloid beta protein accumulated in the brain and the mice showed memory loss and learning impairment.

The finding raises the question of what causes LRP to malfunction. Banks' study in the May issue of Brain Behavior and Immunity suggests inflammation as the culprit and supports using indomethacin, an anti-inflammatory medication, as a buffer to protect LRP from being turned off.

Inflammation, which is part of the body's natural immune response, occurs when the body activates white blood cells and produces chemicals to fight infection and invading foreign substances.

"We induced inflammation in mice and found that it turned off the LRP pump that lets amyloid beta protein exit the brain into the bloodstream. It also revved up an entrance pump that transports amyloid beta into the brain. Both of these actions would increase the amount of amyloid beta protein in the brain."

Banks then gave mice indomethacin, which prevented inflammation from turning off the LRP (exit pump).

His findings help to explain what doctors who are studying the use of indomethacin to treat people with Alzheimer's disease are seeing in their clinical practice.

"Nonsteroidal anti-inflammatory drugs, especially indomethacin, have been associated with protection against Alzheimer's disease. Our work could influence that debate and thinking at the patient-care level," Banks said.

Source: Saint Louis University