

ALZHEIMER'S RESEARCH REVIEW

A publication for friends and donors of Alzheimer's Disease Research

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Could Alzheimer's Disease Be "Type 3" Diabetes?

Groundbreaking research forges new linkages between insulin and memory loss

A researcher previously funded by Alzheimer's Disease Research has uncovered the most persuasive evidence to date that the toxins found in the brains of Alzheimer's sufferers directly interfere with brain insulin signaling—a key component in the formation of memories. These extraordinary findings lend new credibility to the theory that Alzheimer's is another form of diabetes.

Scientists have known for some time that brain insulin is found in lower levels in people with Alzheimer's disease. A research team led by Dr. William Klein, professor of neurobiology and physiology at Northwestern University, found out why. Toxic proteins called ADDLs strip neurons of their insulin receptors and render the neurons insulin-resistant. This, in turn, reduces the brain's ability to create new memories. Insulin resistance in cells is a hallmark of type 2 diabetes. The finding that similar

mechanisms may be at play in Alzheimer's disease has led to a theory that Alzheimer's disease could be considered a third type of diabetes.

"What we have here," Klein told *Time.com*, "is a striking phenomenon that may ultimately explain why the brains of people with Alzheimer's disease are insulin resistant and how that ties into memory."

In healthy brains, insulin binds to receptors in synapses, generating the chemical processes that allow memories to be formed. In brains of Alzheimer's disease victims, Klein and his colleague found, ADDLs prevent insulin receptors from accumulating at the synapses of brain neurons. This results in fewer docking sites for insulin to attach. This insulin resistance may be one of the key triggers of Alzheimer's disease.

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Klein hopes that his team's findings will inform future research in the field and perhaps pave the way for new and more effective treatments.

"We're dealing with a fundamental new connection between two fields, diabetes and Alzheimer's disease, and

the implication is for therapeutics," he says. "We want to find ways to make those insulin receptors themselves resistant to the impact of ADDLs. And that might not be so difficult.

"With proper research and development the drug arsenal

for type 2 diabetes, in which individuals become insulin resistant, may be translated to Alzheimer's Disease treatment. I think such drugs could supersede currently available Alzheimer's drugs."

President's Corner

We all know that the job of caring for someone with Alzheimer's disease is extraordinarily hard. Now researchers are telling us just how hard it is.

The good news is that caregivers can improve their health prospects — but only by first taking care of themselves.

If you are helping someone one through this terrible disease, I urge you to do just that. Clear aside time for yourself. Follow a healthy lifestyle. And to help you cope with stress, make an appointment with a counselor and find an Alzheimer's disease support group near you. (If you need help locating one, go to our web site at <http://www.ahaf.org/alzdis/about/adabout.htm> and click on "Resources.")

Remember: You are not alone. There are thousands and thousands of people who share your struggle.



Brian K. Regan, Ph.D.
President

Please share this newsletter with someone you know who might be interested in learning about some of the latest advancements in research to prevent, treat and cure Alzheimer's disease.

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Stress of Caregiving Can Shorten Lives

Support and Counseling Seen as Keys to Long-Term Health



The stress of caring for an Alzheimer's disease sufferer may shorten a child's or spouse's lifespan by anywhere from four to eight years, according to a new study by Ohio State University and the National Institute of Aging.

Previous studies have found that parents of chronically ill children displayed chromosomal changes that advanced the aging process by several years. This latest round of research found similar effects in Alzheimer's disease caregivers. After comparing samples from this population to comparable non-caregivers, researchers found that the effects of stress could be felt at both the genetic and molecular level.

"Caregivers also had fewer lymphocytes, a very important component of the immune

system," said Glaser, a professor of molecular virology, immunology and medical genetics. "They also showed a higher level of cytokines, molecules key to inflammation response, than did the control group."

In addition, Alzheimer's caregivers exhibited twice the levels of depression symptoms as non-caregivers.

More encouraging news came from a recent New York University study, which found that spouse caregivers who receive mental-health interventions—including individual and family counseling, support groups and telephone counseling—report less physical decline than other caregivers. They also display significantly lower levels of depression.

"Preserving the health of spouse caregivers through counseling and support also benefits the person with Alzheimer's disease, as caregivers who are in poor health are more likely to have difficulty providing good care," said research professor Mary S. Mittelman.



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Research Roundup

Alzheimer's Disease Still a Mystery to Many

Large numbers of Americans don't know that Alzheimer's disease can be treated, and many believe that Alzheimer's disease is a normal part of aging, according to a public-opinion survey by the University of Michigan School of Health.

"Although knowledge about Alzheimer's disease has increased dramatically over the past two decades, misconceptions remain among large segments of the populations," says Cathleen Connell, director of the Education and Information Transfer Core of the Michigan Alzheimer's Disease Research Center. "Continued efforts are clearly needed to educate the public about the disease."

The survey also uncovered different levels of understanding among races. A higher percentage of blacks and Hispanics believe

that Alzheimer's disease is a natural function of aging. Blacks and Hispanics also are more hopeful than whites about the possibility of finding a cure and are more likely to change their diet or lifestyle to avoid developing the disease.

Mediterranean Diet May Add Years to Lifespan

The so-called "Mediterranean diet"—high in fruits, vegetables, cereals, legumes and fish and low in dairy products, meat and poultry—may help Alzheimer's disease sufferers live longer than a traditional Western diet, says a study published in *Neurology*, the medical journal of the American Academy of Neurology.

The study found that Alzheimer's disease patients who adhered most closely to a Mediterranean diet were 76 percent less likely to die over the study's four-and-a-half-year period than those who followed the diet the least. The

results build on earlier studies that a Mediterranean diet can help reduce the risk of developing Alzheimer's disease and can extend the lifespans of healthy people.

Smokers at Higher Risk of Dementia

People who currently smoke are 50 percent more likely than nonsmokers or former smokers to develop Alzheimer's disease or dementia, according to a study published in *Neurology*.

Study author Monique Breteler, of Erasmus Medical Center in Rotterdam, the Netherlands, said that several factors could explain the linkage. Smoking raises the risk of cardiovascular disease, a factor in dementia. Smoking also causes the body to make too many of the chemical waste products called "free radicals," leading to hardened arteries and damaged blood cells.

A Gift that Benefits You...and the Fight Against Alzheimer's Disease

Charitable gift annuities can help both donors and Alzheimer's disease sufferers

If you're 55 years of age or older—and you want to play a major role in helping to cure Alzheimer's disease—you may want to consider a charitable gift annuity.

A charitable gift annuity is an agreement between you and Alzheimer's Disease Research in which you transfer cash or appreciated assets. In return, you (or a person of your choice) will receive fixed payments for life as well as significant tax savings. You can set up a charitable gift annuity with as little as \$5,000 and receive payments annually, quarterly or monthly.

One of the greatest advantages is that in the year that you fund the annuity, you are entitled to an income tax deduction for a portion of the entire amount. Better yet, part of each payment you receive is tax free. You can choose to have payments made to yourself or another party of your choice—or both. It's completely up to you.

Would you like to learn more about the benefits of a charitable gift annuity? There's no obligation at all. Simply contact Gayle Handiboe, Development Manager, at gandiboe@ahaf.org or 1-800-437-2423.

Thank you for thinking of Alzheimer's Disease Research!