

# ALZHEIMER'S SCIENCE NEWS

SPRING 2022



## SLEEP DISRUPTION IN ALZHEIMER'S LINKED TO NEURODEGENERATION IN KEY PART OF BRAIN

Neurodegeneration in the locus coeruleus, which is deep in the brainstem, has been linked to sleep disturbances in people at risk for Alzheimer's disease. This finding could lead to earlier intervention and better treatment options.

People with sleep-related issues have a 1.5 times greater risk of developing Alzheimer's than those who don't, and an estimated 15 percent of cases may be linked to treatable sleep problems. The locus coeruleus is sometimes called the "ground zero" of Alzheimer's. It plays a key role in attention and memory, as well as sleep-wake dysregulation in the preclinical stages of this disease.

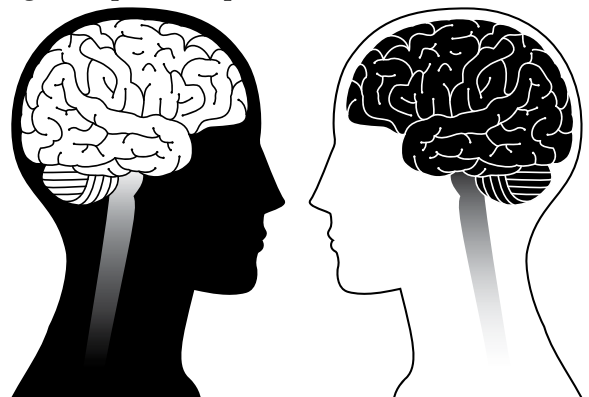
A scientist funded by Alzheimer's Disease Research found that more frequent nocturnal awakenings are associated with a decline in the structural integrity of the locus coeruleus in cognitively unimpaired older adults, especially those with elevated plasma markers of neurodegeneration.

Maxime Van Egroo, PhD, of Maastricht University in the Netherlands, studied 72 adults age 50 to 85 years who underwent an MRI to image the locus coeruleus. The research team used questionnaires to collect information about participants' sleep quality and

measured their plasma levels for biomarkers associated with Alzheimer's.

They found that lower MRI signal intensity in a particular part of the locus coeruleus was connected to a higher number of nocturnal awakenings. This was mostly evident in those with elevated levels of total tau.

These results could pave the way for earlier detection of neurodegeneration. As increased wakefulness is a risk factor for Alzheimer's, it may be possible to treat and slow the disease's progression by targeting disrupted sleep.



*The locus coeruleus, sometimes called the "ground zero" of Alzheimer's, plays a key role in attention, memory, and sleep disruption.*

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## PRESIDENT'S CORNER



The progress being made against Alzheimer's is truly exciting.

The studies funded by Alzheimer's Disease Research are leading to important breakthroughs that expand our understanding of Alzheimer's and offer new hope to people living with this mind-stealing disease.

You make these advances possible. Without support from friends like you, many of these studies would never get off the ground. But with your help, scientists we support are identifying earlier ways to diagnose Alzheimer's and testing ways to prevent it.

Together, I'm confident we WILL ultimately stop this disease. Your partnership is key. Thank you for supporting our lifesaving work!

Stacy Pagos Haller

## RESEARCHERS TARGET RECYCLING SYSTEM TO PREVENT AMYLOID PLAQUES

A scientist funded by Alzheimer's Disease Research found that changing the biochemistry of brain cells in mouse models eliminated the formation of amyloid beta plaques, a defining feature of Alzheimer's.

More than 6 million Americans have this disease, and most develop the late-onset form that arises after age 65. The most significant genetic risk factor is apolipoprotein E4 (ApoE4), one of three protein variants involved in fat metabolism. Due to different amino acids, the ApoE4 variant contains the highest positive charge.

Joachim Herz, MD, of the University of Texas Southwestern Medical Center, focused on early endosomes—specialized structures which sort proteins, either recycling them or transporting them to cellular garbage dumps. Prior research has shown that endosomes are enlarged in people and animals with ApoE4, compared to the other two ApoE variants.

He and his team showed that the positive charges caused ApoE4 to clump inside the early endosomes. This prevented the endosomes from removing proteins, including amyloid plaques.

However, when they used a genetic technique to turn off a gene called NHE6 in brain cells, it made the endosomes more acidic, eliminating the effects of ApoE4 and preventing the amyloid beta from clumping.

This is a highly promising discovery. “We envision that drugs that act on the same protein we inhibited in these mice could someday play a similar role in Alzheimer's disease as statins do in heart disease, helping to prevent the condition from ever developing,” says Dr. Herz.

## RESEARCHER SPOTLIGHT: TIMOTHY SARGEANT, PHD

Could reducing the amount of protein a person consumes also reduce the signs of Alzheimer's disease?

With funding from Alzheimer's Disease Research, Timothy Sargeant, PhD, of the South Australian Health and Medical Research Institute, is trying to find out.

Testing in both mouse models and humans, his research team is studying whether limiting the intake of meat, dairy, nuts, and other types of proteins in midlife prevents the accumulation of amyloid plaques in the brain—a hallmark of Alzheimer's—by increasing autophagy. This is the process by which the body clears waste out of brain cells.

They will also use a new blood test they developed to determine if reducing dietary protein increases autophagy in people.

If successful, this research could identify modifiable lifestyle factors that could delay dementia, as well as the biological mechanisms through which these interventions work.

Dr. Sargeant deeply appreciates the grant he received, thanks to donors who support our critical work. “This funding has provided the bridge from mouse studies to work in humans, bringing us a very important step closer to the prevention of Alzheimer's disease,” he notes.



Timothy Sargeant, PhD

## ALZHEIMER'S: RECREATION & QUALITY OF LIFE

A healthy lifestyle includes exercise as well as social and mental stimulation. This is true even with a diagnosis of Alzheimer's. It can also help you and your loved one better cope with the disease's impact.

### PHYSICAL ACTIVITY

Exercises should include aerobics as well as strength and flexibility training. In the early stages of Alzheimer's, a person can continue to enjoy activities such as jogging, walking, swimming, or basketball. At later stages, they may enjoy modified light activities, such as:

- Walking with a companion
- Aerobic exercise classes at a senior center or local swimming pool
- Light gardening
- Modified sports games with others

As the disease progresses, physical activity can help maintain muscle tone and strength, and improve mood. Physical therapy, light exercise or dance class, or walks with bird-watching groups can be helpful. People with low mobility or balance issues may benefit from exercise or yoga classes where they sit on a chair or wheelchair.

### MENTAL AND THERAPEUTIC ACTIVITIES

Mental activity may help preserve cognitive function and reduce stress or agitation. People can maintain social contacts by taking part in board and card games, word games, and crossword puzzles. If someone loved playing a musical instrument but can't do so now, they may enjoy listening to music or benefit from music therapy.



Other helpful or enjoyable activities might include:

- Engaging in supervised games or projects at adult day centers
- Joining a support group
- Looking at family photos or videotapes
- Making crafts
- Meditation or relaxation programs
- Outings with others to the zoo or for a scenic drive
- Pet therapy

The goal is to build a comfortable, engaging level of activity to support the individual's social, mental, and physical stimulation as much as possible.

To learn more, visit: [www.brightfocus.org/ADRactivities](http://www.brightfocus.org/ADRactivities)

## HEALTHY RECIPE:



### Hearty Chicken Stew

Studies show that eating a nutritious diet is a simple way to help protect your brain's health.

#### Ingredients:

- 1 cup uncooked quick-cooking barley
  - 3 14-ounce cans fat-free, low-sodium chicken broth
  - 1 tablespoon olive oil
  - 1<sup>3</sup>/<sub>4</sub> cups chopped onions, fresh or frozen
  - 1 stalk celery, chopped
  - 1 10-ounce package frozen mixed vegetables (carrots, corn, green beans, and peas)
  - 1 cup cooked chicken, chopped
  - 1/4 teaspoon salt
  - 1/4 teaspoon black pepper
  - 1/4 teaspoon dried thyme
- Fresh parsley for garnish

*See reverse side for directions.*



## Hearty Chicken Stew

*(Continued from front)*

### Directions:

1. Bring barley and broth to a boil in a large pot. Reduce heat and simmer 5 minutes.
2. While barley cooks, heat oil in a large frying pan over medium-high heat. Add onions and celery, and sauté for 3 minutes. Add mixed vegetables and sauté for 2 more minutes.
3. Combine vegetable mixture, chicken, salt, pepper, and thyme with barley mix.
4. Simmer 4 minutes, stirring until well blended. Serve in bowls and garnish with parsley.

*Yield: About 4 servings*



**Alzheimer's  
Disease  
Research**

[brightfocus.org/stopAD](http://brightfocus.org/stopAD)



**You can fight Alzheimer's while reducing your taxable income.**

## IRA CHARITABLE ROLLOVER

Would you like to make a big difference in the fight to defeat Alzheimer's while reducing your taxable income? If so and you're 70½ or older, consider an IRA charitable rollover.

### Benefits:

- Avoid taxes on transfers of up to \$100,000 from your IRA to ADR.
- May satisfy your required minimum distribution (RMD) for the year.
- Reduce your taxable income, even if you don't itemize deductions.
- Make a gift that isn't subject to the deduction limits on charitable gifts.
- Help further the mission of Alzheimer's Disease Research.

### How it works:

1. Contact your IRA plan administrator to make a gift from your IRA to ADR.
2. Your IRA funds will be directly transferred to our organization to help continue our important work.
3. Please note that IRA charitable rollover gifts do not qualify for a charitable deduction.

To learn more, contact Charles Thomas, our Planned Giving Manager, at [plannedgiving@brightfocus.org](mailto:plannedgiving@brightfocus.org) or by calling 301-556-9362.

Please share this newsletter with someone you know who might be interested in learning about some of the latest advancements in research to diagnose, prevent, treat, and cure Alzheimer's disease. This newsletter is published by Alzheimer's Disease Research, a program of BrightFocus Foundation.

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