

Research

REVIEW

FALL 2017



BLOOD VESSEL CHANGES AND HOW THEY RELATE TO ALZHEIMER'S

Cutting-Edge Techniques Progress Our Understanding of the Disease

In a new Alzheimer's Disease Research-funded project at Massachusetts General Hospital in Boston, Rachel Bennett, PhD, is investigating whether tau-induced blood vessel changes contribute to cell death and further accumulation of tau, a key player in Alzheimer's disease. She and her team will also test whether interventions to prevent blood vessel changes can alter the course of the disease.

Dr. Bennett's studies involve cutting-edge microscopy techniques for visualizing alterations to vasculature in the intact, living brain of animal models. Through these techniques, researchers will learn when blood vessel alterations occur and how the changes may relate to Alzheimer's disease pathology. Researchers will also profile the expression of proteins involved in blood vessel growth to identify potential new targets for therapeutics.

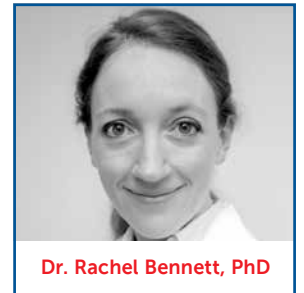
Based on this new understanding of the relationship between tau and blood vessels, researchers hope to use "off the shelf" drugs to alter blood vessel

growth and directly assess their effect on pathological outcomes in these models.

This project is unique in that it examines a novel and previously unexplored interaction between tau pathology and blood vessels.

It will determine if the observed blood vessel changes are harmful and may point toward existing therapeutic options to treat Alzheimer's patients.

"By funding these studies, we have the resources to thoroughly investigate this exciting new line of research," said Dr. Bennett. "I truly believe that the exploration of new disease pathways is critical to the advancement of Alzheimer's disease research as a field and hope that it will lead to the identification of novel drug candidates."



Dr. Rachel Bennett, PhD

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PRESIDENT'S CORNER



This summer, we lost country music legend Glen Campbell to Alzheimer's. He and his family made great strides in bringing this disease out of the

shadows. I've been honored with the opportunity to work alongside Glen's wife and children in our shared mission to support the science that will one day bring a cure, and support the people caring for loved ones with Alzheimer's.

I also feel honored to have dedicated donors like you fighting alongside us to end this mind-stealing disease.

Thanks to your generosity, we are funding some of the world's most innovative scientists in the fight to defeat Alzheimer's. Their most promising ideas may someday be tested in clinical trials. Unfortunately, potential breakthroughs in science can be delayed because of a shortage of volunteers in clinical trials. With this in mind, we will have a series of articles in this issue and future editions to explain how clinical trials work, and what to know if you are considering joining.

I'm truly grateful for your partnership on this journey. Thank you for all that you do.

A blue ink signature of Stacy Pagos Haller.

Stacy Pagos Haller

HOW DO CLINICAL TRIALS WORK?

As part of our ongoing series of articles about clinical trials, we will look at the three phases of clinical trials. Each has a specific purpose in determining the safety and efficacy of a treatment for use by the public.

Phase 1 Clinical Trials evaluate the safety of a drug or a treatment to determine that it is not harmful to people. This testing normally takes place with a small group of healthy volunteers, and negative effects may lead the Food and Drug Administration (FDA) to discontinue the trial.

Phase 2 Clinical Trials test the right dosage and effectiveness in treating a disease. A small group of volunteers who have the disease are assigned to different treatment groups, with each group receiving different doses. The results are then compared to control groups (trial participants who did not receive treatment). If the results show either adverse outcomes or no improvement, the trial can either be suspended or discontinued.

Phase 3 Clinical Trials test whether a treatment is safe and effective for a wide variety of people. With a larger number of volunteers, there can be many groups, especially if the treatment involves a combination of drugs or different components. Again, the results are compared to control groups. If the drug works and the trial is successful, the trial sponsor may now apply to the FDA for approval to manufacture and sell these new treatments, making them available to patients.

Today's clinical trials can lead to better treatments tomorrow. For more information about clinical trials or to find one near you that you may be able to participate in, please visit brightfocus.org/clinicaltrials.

This series of articles promoting awareness of clinical trials is supported in part by an educational sponsorship from Biogen. BrightFocus is solely responsible for the content of this article.

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INVESTIGATING A HIGH-FAT, LOW-CARB DIET IN EARLY ALZHEIMER'S DISEASE

Plenty of research over the years has shown that the brains of people with Alzheimer's disease are unable to use glucose normally. Glucose is a simple sugar produced by the metabolism of carbohydrates.

In an Alzheimer's Disease Research-funded study led by Jason Brandt, PhD, at Johns Hopkins University, a team is testing whether a special diet that has been used to treat other brain disorders may be useful to treat Alzheimer's. The diet is very low in starches and sugars, and very high in fat.

LOSING A LEGEND: GLEN CAMPBELL

All of us at Alzheimer's Disease Research were deeply saddened to learn of country music legend Glen Campbell's passing in August after a long, courageous battle with Alzheimer's.

Glen's music delighted countless fans throughout his career, which spanned more than a half-century. He released his first album in 1962 and his last, titled *Adios*, in 2017. In between, Glen released several hits, hosted his own television show, partnered with numerous music greats, and in 2005 he was inducted into the Country Music Hall of Fame. He remained in fine voice and was a fluid guitarist straight through to his last live performance in 2012.

In 2011, Glen and his wife, Kim, made a powerful decision to go public with his Alzheimer's diagnosis. Together with their family, they lay bare the raw emotions and setbacks of their lives, helping to lower the stigma often associated with Alzheimer's.

The Campbell family's devotion, love, and resilience are truly an inspiration. Because of Glen, more people are lending a helping hand to caregivers and the search for a cure now has a greater sense of urgency and a greater base of supporters.

We will be forever grateful to Glen and his family for the music and the memories, and for all they've done for the Alzheimer's community. In his memory, we will recommit ourselves to investing in the bold, innovative science that will someday end this terrible disease.



Such a diet causes the body to produce "ketones," which can be used by the brain for energy. Dr. Brandt's study will test whether patients with early Alzheimer's or even milder memory problems (known as mild cognitive impairment, or MCI) can stick to this diet for 12 weeks and whether it improves their thinking and memory. The changes in blood indicators of inflammation and fat metabolism are also being studied.

If the diet proves to be acceptable to patients and improves cognitive functioning or slows its decline, it might, following further studies and trials, become a standard treatment for Alzheimer's.

HEALTHY RECIPE:

Sweet Potato & Black Bean Chili

The sweet potato is known as a brain super food that may help protect brain cells and prevent cognitive decline. Sweet potatoes contain substances called carotenoids, which are high in antioxidants. Please enjoy this recipe!

Ingredients:

- 1 medium-large sweet potato, peeled and diced
- 1 large onion, diced
- 4 cloves garlic, minced
- 2 Tbsp. chili powder
- ½ tsp. ground chipotle chili (omit for a mild chili)
- ¼ tsp. salt
- 2½ c. water
- 2 15-oz. cans black beans, rinsed and drained
- 1 14-oz. can diced tomatoes
- 4 tsp. lime juice
- ½ c. chopped fresh cilantro

See reverse side for directions.

Sweet Potato & Black Bean Chili

(Continued from front)

Directions:

1. Heat oil in a heavy pot with lid over medium-high heat. Add sweet potato and onion and cook, stirring often, until onion begins to soften, about 4 minutes. Add garlic, chili powder, cumin, chipotle, and salt, and cook, stirring constantly, for 30 seconds. Add water and bring to a simmer. Cover, reduce heat to maintain a gentle simmer, and cook until sweet potato is tender, 10-12 minutes.
2. Add beans, tomatoes, and lime juice; increase heat to high and return to a simmer, stirring often. Reduce heat and simmer until slightly reduced, about 5 minutes. Remove from heat and stir in cilantro.

Tip: Make ahead, cover, and refrigerate for up to three days or freeze for up to three months.

Serves 4.

From website: eatingwell.com



brightfocus.org/stopAD

ASK THE EXPERT: CAN I GET ALZHEIMER'S DISEASE FROM MY PARENTS?

Alzheimer's disease can be inherited in the genes you receive from your parents at birth, or it can occur "sporadically," which means by apparently random bad fortune.

Among the five percent of **early-onset** cases that are clinically apparent before age 60, the majority represent the effects of inherited gene mutations that increase the development of the two hallmarks of Alzheimer's: amyloid plaques and neurofibrillary tangles. Half the children of a parent with genetically inherited early-onset Alzheimer's will be at very high risk for developing the disease.

Late-onset Alzheimer's (occurring after age 60) is less completely determined by genetic factors. However, evidence is accumulating in support of there being some inherited risk. The E4 version of the gene that codes for the protein ApoE is the best known of the genetic risk factors for late-onset Alzheimer's, but genetic testing for risk assessment is not encouraged. That is because many people have the gene but never develop the disease, while many others have the disease and not the gene, so detecting its presence might be falsely alarming while its absence might offer empty reassurance.



THE IRA CHARITABLE ROLLOVER: A TAX-SAVING WAY TO HELP

Are you 70½ years old or older and required to take minimum distributions from your IRA? If so, you can take advantage of the IRA charitable rollover and benefit Alzheimer's Disease Research, plus receive tax benefits in return. Your IRA charitable rollover gift can satisfy all or part of your required distribution. No matter the size of your gift, you can be certain your support will make a lasting impact.

To learn more about this type of giving, or if you have any questions, please visit brightfocus.org/plannedgiving or call Lauren Fields at 301-556-9397. We are happy to answer any questions you may have.

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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