Alzheimer's Disease Research

Research REVIEW

SUMMER 2017

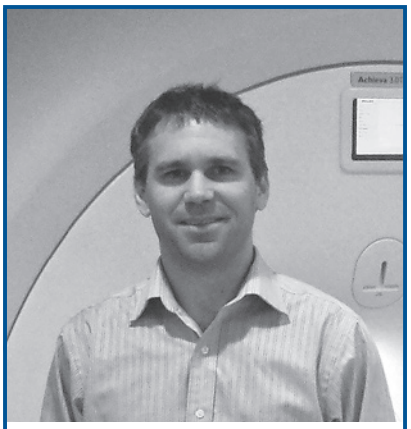
MRI-BASED TECHNIQUE COULD PREDICT DISEASE 10 YEARS OUT

Detecting Alzheimer's at the Molecular Level

Currently, brain imaging of Alzheimer's patients only helps to confirm diagnosis, alongside cognitive and other tests. However, Dr. Francis Hane, a 2015-2017 Alzheimer's Disease Research grantee, and his colleagues are ahead of schedule on a project involving a new magnetic resonance imaging (MRI) technique that may help predict a diagnosis 10 years out. This would permit preventative therapies to be started earlier, when they are more likely to be effective.

The technique, developed by Hane's mentor, Mitchell Albert, PhD, employs molecules to search for and attach to amyloid oligomers, which are chemically altered amyloid-beta proteins believed to sit on the surface of brain cells before the onset of Alzheimer's.

Another hopeful aspect of this work is that biosensors, like the ones this research team is working on, will not only detect early Alzheimer's pathology, but also may inform about disease composition. That information can then be used to choose therapies with the best chance of success.



Francis Hane, PhD

In the future, medicines to slow or stop the root cause of Alzheimer's will need to be taken right out of the starting gate. That's why advances in diagnosis are so important. This project may provide the kind of imaging-based support that personalized medicine requires to detect, treat, or even prevent this disease.

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PRESIDENT'S CORNER

Because of your generosity, Alzheimer's Disease Research is funding innovative science around the world, increasing our understanding of how Alzheimer's begins and how we can someday stop it.

Clinical trials play an important role in research leading to a cure. This critical phase of research, testing new treatments, can be a slow and expensive process, delaying scientific progress. So we are investigating ways to reduce the time it takes to launch and complete this important research phase.

We want to educate people about clinical trials. Therefore, in the coming months, we will share more about how clinical trials work, key questions to ask your doctor, and how you can help make a difference to end this devastating disease faster.

I am glad that Alzheimer's is receiving more attention in both the media and from the government. With your help, we will continue to do all we can to bring this disease out of the shadows.

Thank you for your partnership!

Stacy Pagos Haller

THREE TIPS FOR PREPARING FINANCIALLY FOR ALZHEIMER'S

Upon learning of an Alzheimer's diagnosis, it's important to prepare financially for the time when care will be needed. Preparing early allows the person with Alzheimer's to organize documents, state their wishes for their care, and give loved ones clear guidance. In the long run, this planning and organizing makes it easier on everyone, and possibly saves money. If the disease progresses before plans are made, it may be difficult for the person with Alzheimer's to participate in the organizing and preparations.

Here are three helpful tips for getting started:

1. Organize financial information in a way that someone else can understand, in case it's necessary to share decision-making responsibility down the road. Put this information in one place—a binder, a file, or a drawer—to make it easier for the appointed decision maker and/or power of attorney to follow through on wishes and manage affairs when needed. Information to organize includes:

   Income and Asset Information

   - Pension from an employer, IRAs, 401(k)s, interest, etc.
   - Social Security, Medicare, and Medicaid information
   - Insurance information, including policy numbers, agent names, and phone numbers for life, health, long-term care, home, and car
   - Bank names and account numbers

BLOCKING ASSEMBLY OF TAU PROTEIN INTO TOXIC STRUCTURES

In ADR-funded research led by Paul Seidler, PhD, and mentored by David Eisenberg, PhD, a team of scientists at the University of California, Los Angeles, is developing methods and agents that block the formation and spread of toxic tau conformations. It involves designing inhibitors to target the tau amyloid structure.

Tau protein helps to stabilize the internal structure of neurons in ways that are important for neuronal function. However, the conversion of tau from a normal structural state into pathological assemblies is associated with Alzheimer's disease. Pathological tau structures include amyloid fibers, and a smaller species of tau, called an oligomer, which is thought to promote the spread of pathological tau assemblies throughout the brain.

Investment Income

- Stocks, bonds, and property with stockbrokers' names and phone numbers
- Copy of most recent state and federal income tax returns
- Location of most up-to-date will with an original signature

Liability Information

- Property tax, including what's owed, to whom, and payment due dates
- Mortgages and debts, including how and when they're paid
- Location of original deed of trust for home
- Car title and registration
- Credit and debit card names and numbers
- Location of safe deposit box and key

2. Decide who will make decisions about property and health, and make sure the wishes of the person with Alzheimer's are reflected in legal documents.
3. Collect information about how to plan for the most optimistic care needs, including how decisions will be made and how care will be paid for. Decisions about more comprehensive care needs can be done later.

Paul Seidler, PhD

Dr. Seidler's project will expand our understanding of Alzheimer's by identifying toxic forms of the protein to be used as a template enabling the design of peptide agents that block the assembly of these structures. Natural variations in tau that protect against the formation of toxic assemblies will be studied to uncover new possibilities for therapeutic intervention, and to gain insights into the mechanisms by which amyloid fibers form, propagate, and exert toxicity.

"As a research scientist," Dr. Seidler says, "I am fascinated by the biological circumstances that lead to Alzheimer's disease; in fact, many of the areas of science that continue to drive me culminate in the molecular events that lead to this disease. Thanks to dedicated scientists who have worked for over a decade to understand the molecular basis of Alzheimer's, I am fortunate to be nearing the cusp of what I believe will be a medical revolution, one in which an arsenal of therapeutic agents will soon emerge."

BRAIN FOOD RECIPE:

Tuna Avocado Lettuce Wraps

Avocados are known to contain disease-fighting nutrients. As a monounsaturated fat, the avocado may lower blood pressure and increase blood flow, two factors that can help reduce the risk of cognitive decline.

Ingredients:

- 1/2 very ripe avocado
- 2 Tbsp. mayonnaise
- 1 can tuna in water, drained
- 1/4 cup green olives, halved
- 1 scallion, diced
- 2 Tbsp. green chiles, diced
- 2 large leaves of green leaf lettuce

See reverse side for directions.

Tuna Avocado Lettuce Wraps

(Continued from front)

Directions:

1. Mash avocado until creamy, then mix with mayonnaise.
2. Add tuna, olives, scallion, and chiles to avocado mayo mixture.
3. Place one scoop of tuna salad on each lettuce leaf and enjoy!

Serves 2.

From website: alzheimers.net

Alzheimer's Disease Research

brightfocus.org/stopAD

ASK THE EXPERT: WHAT ARE CLINICAL TRIALS AND WHY ARE THEY SO IMPORTANT?

Clinical trials play a critical role in the development of new treatments. Clinical trials are the final phase of the research process that ultimately determines whether a treatment will be approved for use by people. They are the culmination of years, often decades, of work done by researchers to find ways to slow, treat, or even cure diseases like Alzheimer's. Unlike earlier phases of research, clinical trials are completely dependent on the volunteer participation of patients and others who are personally invested in seeing new treatments become available.

Clinical trials are undertaken to test whether a new drug or treatment is safe and effective, which requires successive levels of proof that it will effectively treat people who have a certain disease or condition. This series of clinical hurdles is referred to as Phase 1, 2, and 3 clinical trials, and each phase is closely regulated by the FDA to ensure that all steps are done properly and adhere to strict standards governing the drug approval process. By establishing safety and effectiveness, these trials will ultimately determine whether a drug or treatment will receive approval by the FDA, and the conditions for which they can be marketed and sold in the United States.

Both people with a medical condition and healthy individuals may consider participating in clinical trials. Volunteers first must meet certain criteria to qualify for enrollment. Before deciding and giving their informed consent, seek as much information as possible about the trial, and think seriously about the benefits and risks of volunteering.

Clinical trials are crucial for researchers to make progress toward discovering a cure for Alzheimer's. To learn more about clinical trials and find one near you that you may be able to participate in, please visit **brightfocus.org/clinicaltrials.**

LEAVE A LASTING LEGACY

When you leave money or assets to Alzheimer's Disease Research through your financial or estate plans, you have the opportunity to turn your personal experience with Alzheimer's Disease Research into a lasting legacy that will impact future generations.

There are many ways that you can leave a lasting legacy, including charitable gift annuities or in your will. For more information, please call Lauren Fields at **301-556-9397** or visit **brightfocus.org/plannedgiving.**

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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