

Mind Matters

Alzheimer's Disease Research Center (ADRC) Center for Cognitive Neurology

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Section 1: Blood Tests for Alzheimer's Disease? *By: Mark A. Bernard, PhD*

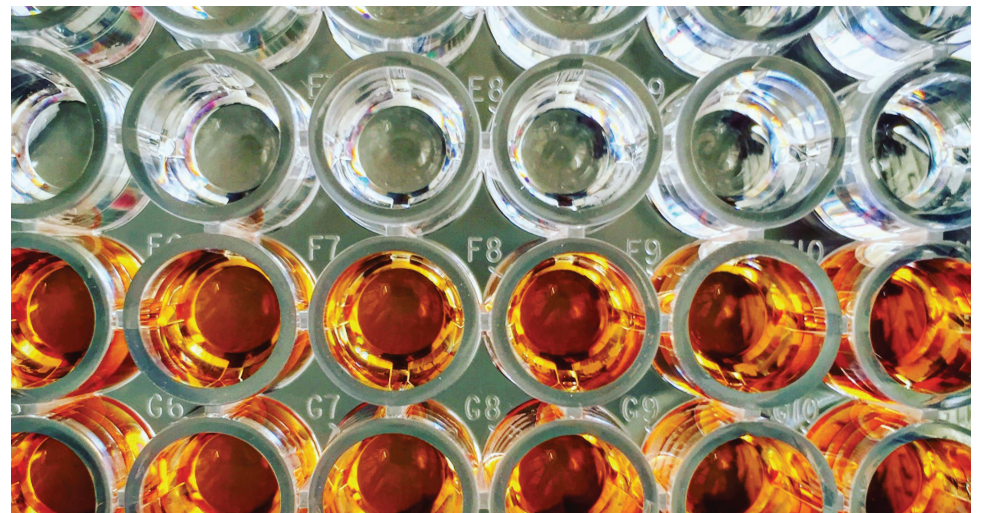


Photo credit: Ludovic Debure, Senior Research Technician with the ADRC

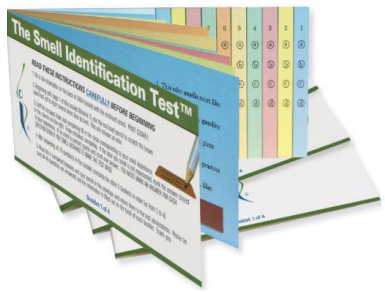
Alzheimer's disease is the most common cause of dementia in the United States, affecting more than six million people over age 65. There is no cure, but early detection can be key to the development of effective treatments. Although there are cutting-edge techniques such as PET scans and analysis of cerebrospinal fluid to aid in early diagnosis, these procedures can be costly, time consuming, or invasive.

A potential solution that has emerged recently is looking at blood-based biomarkers of Alzheimer's disease. Broadly speaking, a biomarker is a measurement that predicts or evaluates the status of a disease. When properly identified and measured, biomarkers can allow us to diagnose early and track the progress of disease in response to treatment. Thanks to new, state-of-the-art technologies such as single molecule array assays (SIMOA), that enable precise analysis of blood plasma for markers of Alzheimer's disease, these plasma biomarkers are now an area of intense research interest. Here at the ADRC, my research focuses on analysis of plasma biomarker data from participants to determine which biomarkers are most important at early stages and how they associate with other symptoms such as those related to sleep and mood.

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Further development of these biomarkers could ultimately lead to fast, cheap, minimally invasive diagnostic tools, perhaps one day even becoming part of routine practice. My work will also help us understand the biology of early stage Alzheimer's disease, which can help develop new treatments. Overall, having such tests in the clinician's toolbelt could lead to much earlier detection and intervention for patients than is currently possible, as well as greater willingness of these patients to be evaluated due to the ease of testing.

Section 2: Sniffing Out Alzheimer's Disease By: Arjun Masurkar, MD, PhD



Smells and scents can evoke strong emotional responses that remind us of days past. This is most famously depicted by the French author Marcel Proust who described how eating a madeleine cake brought back strong memories of his childhood with his mother. This linkage between the sense of smell and memory is thought to arise because of the brain's wiring: the brain areas for memory are intimately connected to areas that receive information about smell. Consequently, there has been increasing evidence that loss of smell is linked with memory impairment associated with Alzheimer's disease. As such, perhaps evaluating the sense of smell could be used as a simple, non-invasive test for Alzheimer's disease. For this to become a reality, more work needs to be done to refine smell evaluation so that it is more accurate and specific to Alzheimer's disease itself.

Motivated by this, we have newly incorporated smell testing as part of the ADRC evaluation, using a validated, 40-item "scratch-and-sniff" kit. We aim to determine how smell test scores correlate with performance on memory and other measures in the evaluation, and how well it can predict future performance. This will be an important contribution to improve the efficient detection of Alzheimer's disease, especially at very early stages when interventions may be more successful.

Section 3: Brain Fog After COVID-19 By: Omonigho M. Bubu, MD, PhD, MPH

We are around three years into the COVID-19 pandemic. With vaccination and high rates of community spread, both of which have helped to build immunity, COVID-19, though still a present threat, seems to be relatively under control in the United States. Most people who get COVID-19 recover uneventfully, but some people continue experiencing a variety of lingering symptoms, such as fatigue, memory problems, breathlessness, muscle pain and others, long after the acute infection is over. This has prompted experts and various healthcare bodies to define the "post-COVID syndrome" as signs and symptoms that develop during or after a COVID-19 illness and continue for more than 12 weeks and that cannot be explained by an alternative diagnosis. Symptoms that persist beyond two weeks for mild disease, beyond four weeks for moderate to severe illness, and beyond six weeks for critically ill patients are termed "long COVID syndrome".

We have also learned from numerous studies that SARS-CoV-2, the virus causing COVID-19, can affect the nervous system. A study conducted within a large hospital network in Chicago found that neurologic symptoms were present in 42% of patients at COVID-19 onset, in 63% of patients at hospitalization, and in 82.3% of patients at any time during the disease course. Notably, over 30% of patients presented with impaired cognition at COVID-19 onset.

Here at NYU Langone Health, 14% of our hospitalized COVID-19 patients had new neurological findings, including stroke, seizures, neuropathy, and others. We have also found that in these patients, blood biomarkers of neurodegeneration (proteins produced when brain cells malfunction or die) were elevated to levels observed in Alzheimer's disease patients without COVID-19. Higher levels of these biomarkers were associated with worse patient outcomes. These findings suggest that COVID-19 patients may sustain a significant neurologic injury. This raises a concern that COVID-19 may worsen pre-existing cognitive deficits and increase the risk of developing Alzheimer's disease and other neurodegenerative conditions.



Photo credit: Ludovic Debure, Senior Research Technician with the ADRC

People with long COVID often complain of "brain fog," which includes difficulty thinking and concentrating, confusion, and worsened memory. In a 2020 study of 2,696 patients (18-55 years old) hospitalized with COVID-19, 7.2% reported brain fog associated with long COVID-19. Patients were significantly more likely to experience chronic post-COVID brain fog if they were female, had respiratory problems at the onset of illness, or were admitted to intensive care unit (ICU). Another large study published in the fall of 2022 found that 45.7% of patients with long COVID reported experiencing brain fog or poor memory.

So what should you do if you think that you may be experiencing COVID-19 brain fog? It is vital that you see your doctor and share all of the persistent symptoms that you are experiencing. It is very important to investigate what may be causing brain fog, because it may be linked to COVID-related damage to organs and systems and associated symptoms. Studies have also shown that engaging in mentally stimulating activities later in life can help reduce risk for developing mild cognitive impairment, a precursor of Alzheimer's disease. Engaging in activities that help stimulate thinking and memory, such as aerobic exercise, eating healthy, sleeping well, and avoiding alcohol and drugs may help alleviate brain fog. Other activities that can be beneficial include engaging in novel cognitively stimulating activities like puzzles and board games, listening to music, practicing mindfulness, and keeping a positive mental attitude. These activities fall into three categories: learning new things, consolidating what you already know, and engaging in exercise. In summary, although most patients recover from COVID-19, the illness may have both short- and long-term effects on your cognitive functioning, memory, and mood. Consulting your doctor and engaging in activities that boost thinking and memory may help with post-COVID-19 brain fog.

Section 4: Brain Food By: Emily Johnston, PhD, MPH, RDN, CDCES



Salmon with broccoli rabe and brown rice, oatmeal with sliced berries and slivered almonds, turkey and white bean chili with lots of herbs and spices, a kale and spinach frittata. These dishes are all on the menu of the Mediterranean diet and the MIND (Mediterranean-DASH Intervention for Neurodegenerative Delay) diet. DASH stands for Dietary Approaches to Stop Hypertension. Both of these diets emphasize fruits and vegetables, whole grains, lean protein, and healthy fat and limit excess sugar, salt, saturated fat and alcohol intake. Research shows that people whose diets adhere closely to these dietary patterns may have slower age-related cognitive decline.

The MIND diet encourages consuming plenty of whole grains and leafy green vegetables (like kale, spinach, collard greens), fruits (especially berries), eating seafood at least once a week, and a regular intake of beans, nuts, and olive oil. There is no evidence that specific foods in isolation or any vitamin or mineral supplements can reduce risk of Alzheimer's disease, but following a healthy diet can protect your brain and reduce your risk of chronic disease.



You do not have to convert your kitchen overnight, but you can start by replacing some sweeter and saltier snacks with fruits and nuts, including a serving of fish each week, or adding some darker greens to your salad or roasted vegetable tray. Even small changes will help you create healthier eating habits, and in the long run, may help improve your health and reduce your risk of Alzheimer's disease. Check out: <https://www.nia.nih.gov/health/what-do-we-know-about-diet-and-prevention-alzheimers-disease>.

Section 5: Participant Corner By: **Nina Streich**



Shortly after my mother's Alzheimer's disease diagnosis, I signed up as a longitudinal brain health research subject with the ADRC. I have been in the program for over 15 years now and find it one of my most valuable volunteering opportunities. I have learned a great

deal from my participation, which helped me understand and deal with my mother's decline. It has been exciting to follow the developments in Alzheimer's disease research – and by my participation, to have contributed a tiny bit to that research so that hopefully new treatments for this disease will be found. Most people have a relative or friend with some form of dementia. I highly recommend signing up as an ADRC research subject. As an ADRC participant, you can get support for your loved ones and take part in finding the cure for Alzheimer's disease.

Section 6: Upcoming ADRC Events

Spring Seminar 2023

- **Evolution of the Amyloid Hypothesis – From Theory to Lecanemab**
Arjun Masurkar, MD, PhD
- **Music Makes a Happy Home**
Kendra Ray, PhD
- **Healthy Eating for Healthy Aging**
Emily Johnston, PhD, MPH, RDN, CDCES

Presentations are followed by a panel discussion and light refreshments.

Tuesday, June 13, 2023 4-6 pm

NYU Medical Center, 550 First Avenue, Alumni Hall B

Learn at Home

- **Equity in Alzheimer's Disease Diagnosis**
Anthony Briggs, PhD

Friday, May 19, 2023, 12-1 pm

Zoom



Scan QR code to RSVP or click the link below:

https://is.gd/CCN_EVENTS_RSVP

Section 7: From Costa Rica to New York! By: **Carolina Boza, MPSc**



I am a Clinical Psychologist and Professor from the University of Costa Rica. I had the opportunity to intern at the ARDC during the fall of 2022. My experience at the ADRC has been very enriching both personally and professionally. Learning the protocols used for

research, diagnosis, and treatment of Alzheimer's disease from such a highly prestigious center represents a valuable opportunity to develop this knowledge in my country.

Multiple studies have revealed that Hispanics are at a higher risk of developing Mild Cognitive Impairment and Alzheimer's disease compared to non-Hispanic Whites, but there is a lack of research in understanding the cause of this difference. Evidence suggests that such a difference may be caused not only by biological and genetic risk factors (such as high blood pressure, diabetes, heart disease, or the APOE4 gene), but also by environmental conditions (including housing conditions, nutrition, pollution) and cultural characteristics (including values, beliefs, habits). Also, access to education and health care may have an important role.

Exploring the scientific findings in Hispanic populations and non-Hispanic Whites in the U.S. opens a door for us to better understand Alzheimer's disease, from a genetic or biological standpoint and from a cultural, economic, and social perspective.

I hope to share what I have learned from my experience at the ADRC with my colleagues in Costa Rica and continue to improve our work in early diagnosis and treatment of Alzheimer's disease in our country.

Section 8: Socialization and the Brain By: **Tatianne Martinez, MSN, FNP-BC**



Does socialization play a role in healthy brain aging?

Yes! Many studies have found that socialization plays an important role in cognitive health and may lower the risk of developing dementia. Socializing can help promote healthy behaviors, like staying physically active. For example, walking with a group of friends or playing a team sport involves physical activity, which is a key lifestyle factor known to contribute to good health. Maintaining an active social life also tends to improve mental health by keeping your mind off stressors. Improving your overall mood can lead to decreased depression, anxiety and greater life satisfaction, all of which can help to maintain cognitive function. Socialization also improves brain health by building up cognitive reserve through the use of cognitive skills such as memory and language when socially engaged.

One study found that women with larger social networks had a lower risk of developing dementia than those with smaller social networks. In another study, people who had almost daily contact with friends had a 12% lower risk for developing dementia than people who socialized with friends once every few months. If you are looking for ways to make new friends, try joining your local community center, search for volunteer opportunities, or try an online website such as Meetup.com to create new connections. So, start improving your brain health and make a new friend today!

Section 9:
Researcher Spotlight



Black Men's Brain Health Conference, February 8-9, 2023
Anthony Briggs, Junior Faculty in Department of Neurology at NYU
Robert Turner II, Assistant Professor at The George Washington University
Ashley Shaw, Research Assistant Professor at University of Kansas
Josh Gills, Post Doctoral Fellow at Rutgers University

Dr. Anthony Q. Briggs is junior faculty in the Department of Neurology and researcher who has received notable training awards and grants that assist researchers in launching their careers, including:

- The Program to Increase Diversity in Behavioral Medicine and Sleep Disorders Research Summer Institute or PRIDE at the University of Miami (June 2022).
- The Alzheimer's Association Interdisciplinary Summer Research Institute (August 2022).
- The Black Male Brain Health Emerging Scholars Program (February 2023).
- The Young Investigators Research Forum scholarship from the American Academy of Sleep Medicine (April 2023).
- Sleep and Circadian Workshop in Indispensable Methods at the University of Pittsburgh Center for Sleep and Circadian Science (April 2023).
- Research Education Component Scholar Mock Study Section (review of mock grant applications) from the National Institutes of Health (May 2023).

It was through PRIDE that Dr. Briggs was awarded a small research proposal to examine the association between subjective cognitive decline, sleep duration, and the social determinants of health in African American populations. He will conduct data analysis, using a dataset from the ADRC.



Free Community Event

Center for Cognitive Neurology

Alzheimer's Disease Research Center (ADRC) Spring Seminar

Tuesday, June 13, 2023
4-6pm

NYU Langone Health
550 First Avenue, Alumni Hall B

Please RSVP here:
https://is.gd/CCN_EVENTS_RSVP

If you prefer to participate over Zoom, please contact Zena at zena.rockowitz@nyulangone.org or call 212-263-1055.

4:00pm Welcome



Thomas Wisniewski, MD
Professor, Departments of Neurology, Pathology, and Psychiatry
Director, Center for Cognitive Neurology, Alzheimer's Disease Research Center
NYU Grossman School of Medicine

4:25pm Music Makes a Happy Home



Kendra Ray, PhD
Research Assistant Professor, Department of Rehabilitation Medicine, Department of Psychiatry
NYU Grossman School of Medicine

4:05pm Evolution of the Amyloid Hypothesis – From Theory to Lecanemab



Arjun Masurkar, MD, PhD
Assistant Professor, Departments of Neurology and Neuroscience & Physiology
Clinical Core Director, NYU Alzheimer's Disease Research Center
NYU Grossman School of Medicine

4:45pm Healthy Eating for Healthy Aging



Emily Johnston, PhD, MPH, RDN, CDCES
Research Assistant Professor, Department of Medicine
NYU Grossman School of Medicine

5:05pm Panel Discussion

5:25pm Reception with Light Refreshments

