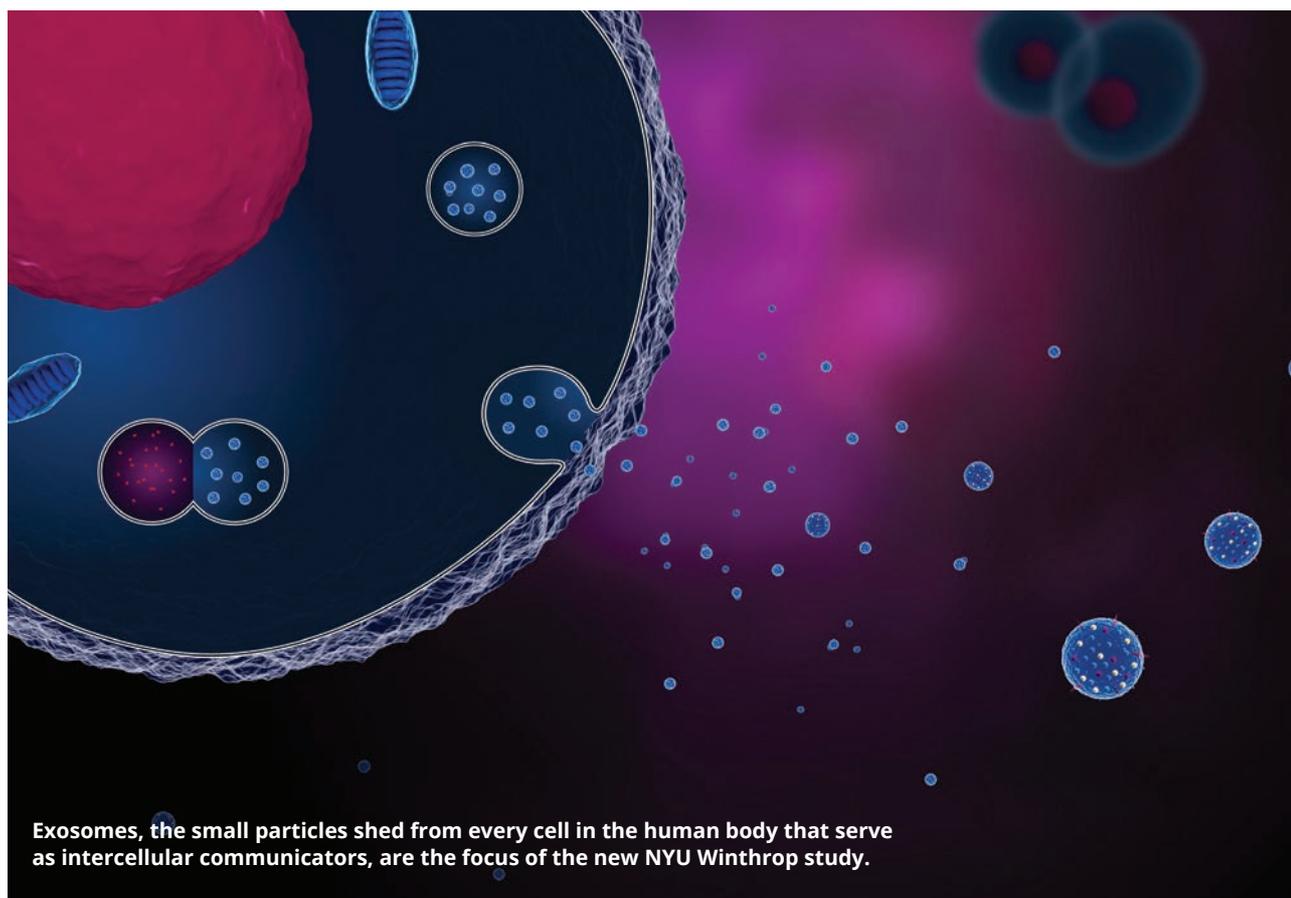


INVESTING *in* HOPE

Research Initiatives Funded by the Alzheimer's Foundation of America



Exosomes, the small particles shed from every cell in the human body that serve as intercellular communicators, are the focus of the new NYU Winthrop study.

NYU Winthrop Hospital Research Scientists Seeking a Path to New Treatments, Causes, Biomarkers

Among the many reasons that it's so extraordinarily challenging for scientists to study and develop new treatments and cures for Alzheimer's is that brain neurons are only available post-mortem. But scientists at NYU Winthrop Hospital Research Institute and NYU Long Island School of Medicine are using a handy work-around to study brain neuron activity—much easier-to-acquire blood samples. New cutting-edge research,

funded by AFA, will allow scientists to study potential Alzheimer's treatments, underlying causes and biomarkers using the blood samples of people both living with Alzheimer's and free of the disease.

How is it even possible to study brain neurons with blood? Scientists are able to combine blood platelets with adult stem cells engineered to take on the properties of human neurons. Interestingly, platelet-rich

plasma already contains abundant amyloid-precursor protein (APP) and the "machinery" involved in APP processing associated with the development of Alzheimer's. Individualized blood samples will enable researchers to get a personalized profile of the amyloid processing machinery of each person, making it potentially possible, over time, to predict Alzheimer's in those at risk.

Continued on page 2

NIH Awards \$4.3 Million to Develop Next-Generation Alzheimer's Treatments

The National Institutes of Health (NIH) just awarded a \$4.3 million research grant to Stony Brook University to pursue a study over the next five years to develop treatments that can potentially arrest and reverse memory loss in people living with Alzheimer's. The team received an initial grant of more than \$200,000 from the Alzheimer's Foundation of America (AFA) to prove the potential of their approach, which involves both human imaging and examination of a mouse model of Alzheimer's disease.



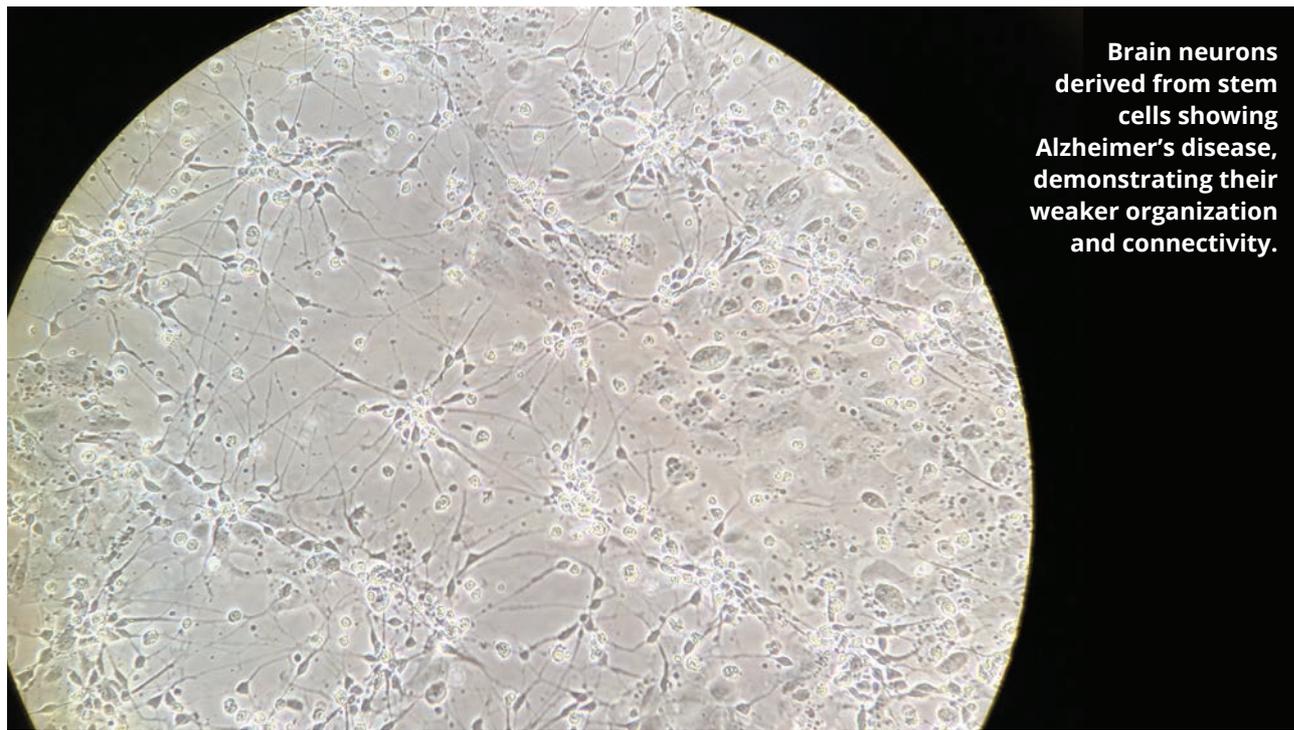
At the announcement of the initial AFA grant award (left to right), Dr. Christine DeLorenzo, Director, Center for Understanding Biology Using Imaging Technology (CUBIT) at Stony Brook University; Bert Brodsky, Board Chair, AFA; and Charles Fuschillo, Jr., President & CEO, AFA.

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NYU Winthrop Hospital Seeking a Path

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The NYU Winthrop researchers will examine exosomes, small particles shed from every cell in the human body that serve as intercellular communicators. The specific exosomes that originate from neurons will be isolated. These vesicles carry genetic information and proteins to other cells in the body. Researchers will investigate differences in this information between healthy individuals and those with Alzheimer's. Since these reflect differences in actual brain neurons, they plan to use the data gained to reprogram Alzheimer's neurons to behave more like those in healthy people.



Brain neurons derived from stem cells showing Alzheimer's disease, demonstrating their weaker organization and connectivity.

NYU Winthrop Research Institute



decades, only a handful of medicines were approved to treat Alzheimer's, while the vast majority of clinical trials—more than 120—were halted. Previous trials often fail to replicate the complex neurological activity in the human brain. That contrasts with research to find cures for cancers of the liver or lungs, for example, where it is increasingly common for pieces of tissue to be extracted for biopsies—and for profiling of cancer cells—to come up with optimal treatment regimens.

"We do not have an accurate predictor of who is susceptible to Alzheimer's disease," said Dr. Reiss.

"We are leveraging the similarity in processing between neurons and platelets to develop a test system, using all human components. This will enable us to test drugs that hold a promise for Alzheimer's treatment."

"Having cared for a loved one with Alzheimer's, I know how hard this disease is on families and how desperately new treatments are needed," said AFA Founder and Chairman Bert E. Brodsky. "We're hopeful that NYU Winthrop's research can make a game-changing scientific breakthrough that will improve the lives of families affected by this terrible disease." ■

"NYU Winthrop's non-invasive exosome approach may prove to be one of the best methods for evaluating the human system in order to advance Alzheimer's research," said Dr. Allison Reiss, Head of the Inflammation Section at NYU Winthrop Hospital's Research Institute and Associate Professor, NYU Long Island School of Medicine. "Examining these particles from brain neurons is like conducting detective work, since they provide clues to what is actually occurring in the brain itself."

This innovative approach has evolved out of research that Dr. Reiss' team has been conducting for the last five years, much of it funded by a previous AFA grant. Dr. Reiss noted that in the last two



Interested in participating in the Dr. Allison Reiss/NYU Winthrop Hospital study?

Contact the Alzheimer's Foundation of America at 866-232-8484.

Researchers are looking for men and women, ages 65 and over, who have been diagnosed with Alzheimer's as well as people without the disease who are cognitively normal to serve as controls (you need not be located locally to participate).

NIH/Stony Brook University

Next-Generation Alzheimer's Treatments

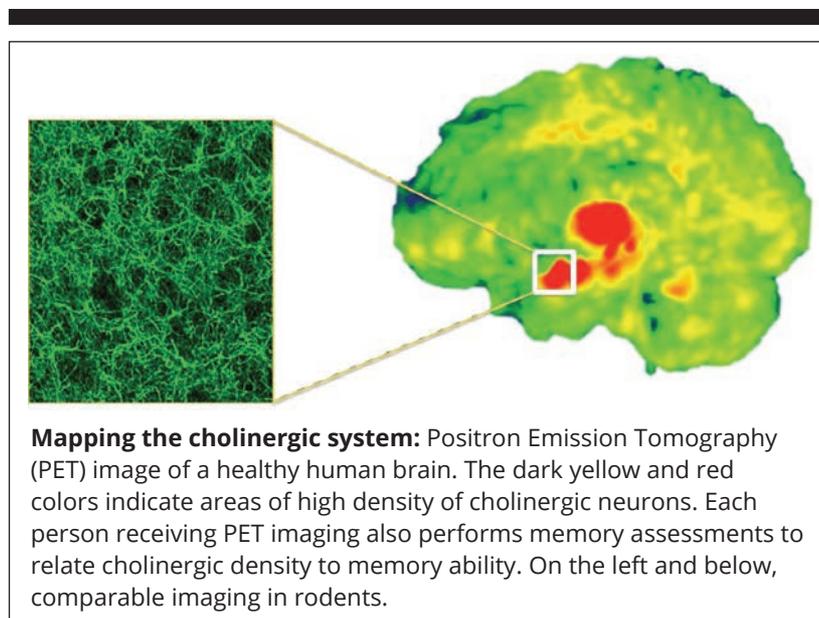
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The team of cross-disciplinary faculty spanning biomedical engineering in the College of Engineering and Applied Sciences and psychiatry in the Renaissance School of Medicine aims to develop an approach to find the source of the damage to the cholinergic neurons that results in Alzheimer's disease.

Principal Investigator Dr. Christine DeLorenzo's lab at Stony Brook University focuses on the neurobiology of mental illness using brain imaging, artificial intelligence and technology to obtain the most comprehensive views of the brain possible. "If we know exactly what is altered in the biology, then we can develop the next generation of treatments," Dr. DeLorenzo said.

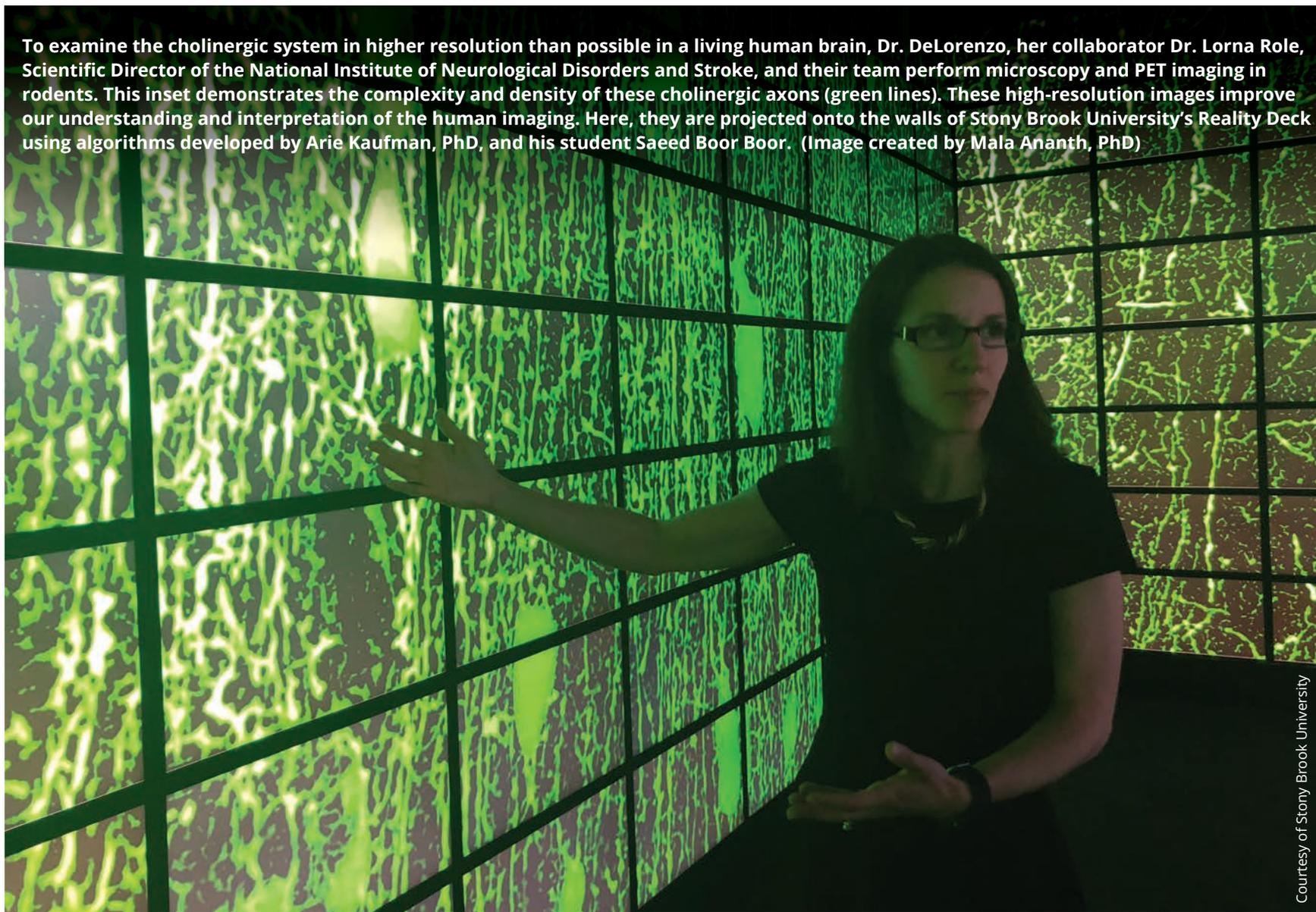
It has been known since the 1970s that cholinergic neurons are responsible for memory cognition in the human brain. They employ a neurotransmitter, acetylcholine (ACh), to communicate with each other for memory retrieval. It has also been known for some time that decreased levels of ACh are found in Alzheimer's patients. Prevailing treatments for the disease have focused on boosting the levels of ACh, but these have been minimally effective in arresting the progression of memory loss.

Dr. DeLorenzo said, "Medical science has known for some time that Alzheimer's is a result of the 'memory network' in the brain falling apart. What we intend to discover is how the network deteriorates and how to fix it." ■



Mala Ananth, PhD, Stony Brook University

To examine the cholinergic system in higher resolution than possible in a living human brain, Dr. DeLorenzo, her collaborator Dr. Lorna Role, Scientific Director of the National Institute of Neurological Disorders and Stroke, and their team perform microscopy and PET imaging in rodents. This inset demonstrates the complexity and density of these cholinergic axons (green lines). These high-resolution images improve our understanding and interpretation of the human imaging. Here, they are projected onto the walls of Stony Brook University's Reality Deck using algorithms developed by Arie Kaufman, PhD, and his student Saeed Boor Boor. (Image created by Mala Ananth, PhD)



Courtesy of Stony Brook University

Tangles in the brain's frontal lobe may be associated with psychosis in Alzheimer's

The Feinstein Institutes For Medical Research
Seeking Treatments for Alzheimer's Psychosis

Among some of the hardest and heartbreaking situations families face when caring for a person living with Alzheimer's is dealing with the agitation, paranoia, hallucinations, and aggression that occurs among half of individuals.

Currently, the only drugs available to treat these symptoms are the powerful anti-psychotics used for schizophrenia; but these can have serious side effects, including an increase in cardiovascular issues and strokes in older adults.

Dr. Peter Davies, the Director of the Litwin-Zucker Center for the Study of Alzheimer's Disease and Memory Disorders at The Feinstein Institutes for Medical Research in New York, and his team want to change that. They are exploring the underlying causes of the more disturbing behaviors associated with Alzheimer's as a means for identifying ways to treat them.

Geriatric psychiatrist Dr. Jeremy Koppel has identified

a series of changes, including the accumulation of tau in the brain's frontal cortex, perhaps driven by excess dopamine concentrations, as a potential cause of the psychosis. The abnormal accumulation of the protein tau is one of the hallmarks of Alzheimer's.

AFA has funded a \$500,000 five-year study, now in its fourth year, to test a variety of new drugs, including tau antibodies, as potentially targeted treatments without the dangerous side effects. Dr. Davies is hoping their findings will lead to the emergence of compounds to be tested in clinical trials.

"These behaviors are a major cause of families moving a loved one from home to a residential healthcare setting," said Dr. Davies. "AFA recognized the urgent need for research in this very difficult area. Dr. Jeremy Koppel and I, along with our team, have made real progress and are excited to continue this research." ■

Emory University—Goizueta Alzheimer's Disease Research Center
Outreach to African American Communities a Priority



Photos courtesy of GADRC

A recent "Community Brain Health Forum" at Mount Vernon Baptist Church, Atlanta, drew more than 110 attendees, where 54 individuals expressed interest in research participation.

Alzheimer's affects families of all races, ethnicities and genders in growing numbers, but African Americans are especially affected by it. A recent National Institute on Aging study points to growing evidence of different biological mechanisms associated with race. We need to know much more. Part of the solution is outreach to the African American community.

That's why it was important for AFA to team up with Emory University's Goizueta Alzheimer's Disease Research Center (GADRC) and its Minority Engagement Core, which for more than a decade has worked to engage and build trust in the Atlanta African American community. Many African Americans, unfortunately, hold some distrust of healthcare and are less likely to seek medical care. GADRC's goals are key: to advance cutting-edge research, identify novel biomarkers, therapeutic targets and reduce existing racial disparities.

With a \$50,000 AFA grant, GADRC is strengthening its grassroots outreach capacity and providing life-changing education, screening and treatments to growing numbers of African American adults right in their own neighborhoods, at local health events.



Seara McGarity, President of the Atlanta Black Nurses Association

"We only go where we can develop long-term relationships and know we will be invited to return," said Monica W. Parker, MD, GADRC Minority Engagement Core Director. It's critically important to establish continuity of care and trust. Over the years, GADRC has also established a partnership with the Atlanta Black Nursing Association which provides staff for on-site memory screening.

Said Dr. Parker, "Because Alzheimer's disease may have a 'silent phase' that begins decades prior to first symptoms, most of our education events have themes of healthy aging, early memory screening and detection. The beauty of our programs is that we are enabling participants to make informed decisions about their general health now so that they can preserve what they have longer," said Parker. "This population is also seriously under-represented in Alzheimer's disease research. A dedicated effort to engage African Americans truly justifies our sustained and concerted effort."



"Community Brain Health Forum" event

Beyond the AFA fiscal backing, these community efforts have endorsed GADRC in the African American community and affirmed a commitment to an enduring interpersonal, healthy partnership. ■

Simple Act, Potentially Big Impact



Rep. Tom Suozzi (left) and Rep. Peter King, announcing the bipartisan legislation.

Washington has prioritized progress in the fight against Alzheimer's over the last several years. Democrats and Republicans are working together on another step forward to further increase federal funding to fight Alzheimer's through a very simple act: letting people check off a box on their federal income tax returns.

Under the proposed legislation, taxpayers could make a voluntary contribution to a new Alzheimer's Research and Caregiving (ARC) Trust Fund through a checkoff on their income tax forms. The amount of the voluntary contribution will be deducted from the taxpayer's refund or added to their tax liability.

Of the funds raised, half will be provided to the National Institutes of Health (NIH) for clinical research into a cure or modifying treatment for Alzheimer's disease; half will be used by the Administration for Community Living (ACL) to fund dementia caregiver services and supports.

Working together with AFA, Rep. Tom Suozzi (D-NY3), Rep. Peter King (R-NY2), Rep. Maxine Waters (D-CA43), Rep. Christopher Smith (R-NJ4) and Rep. Brian Fitzpatrick (R-PA1) introduced the legislation.

It is important to note that the funds collected for the ARC Trust Fund

would supplement, not supplant, existing federal appropriations to NIH and ACL to fight Alzheimer's. Washington provided record-level funding for Alzheimer's research in fiscal year 2019 (\$2.34 billion), finally topping the \$2 billion a year minimum scientists say is required to meet the National Plan to Address Alzheimer's Disease goal of finding a cure or disease-modifying treatment by 2025. But the need is steep: The failure rate for experimental cures or treatments reaching phase III clinical trials is 99%.

Thirty states have similar laws allowing taxpayers to make voluntary contributions to different causes through their state income tax returns. Since 1976, taxpayers

can voluntarily contribute to the Presidential Election Campaign Fund through their income taxes to help finance political campaigns. From January 2018 through May 2019, that fund received over \$47 million in voluntary contributions, according to the Federal Election Commission (FEC).

With more than 154 million individual federal tax returns filed in 2018 alone, this simple checkoff could potentially have a big impact in delivering additional dollars for Alzheimer's disease research and caregiver support.

"This is a responsibility we all share and something that folks on both sides of the aisle should get behind," said Rep. Suozzi. ■

Here's how you can help!

Contact your federal representatives and ask for their support.

To find your Congressperson

Visit www.house.gov or call the Capitol switchboard at 202-224-3121 to connect with your Congressperson and urge them to support HR 3453, the legislation creating the ARC Trust Fund (or thank them if they are already a bill sponsor).

To find your Senators

Visit www.senate.gov or call the Capitol switchboard at 202-224-3121 to connect with the two Senators from your state and urge them to introduce companion legislation to HR 3453 in the Senate.

Hadassah Medical Organization

Using Mental Orientation to Diagnose Alzheimer's Earlier



Imagine if Alzheimer's could be diagnosed as much as 10 or even 15 years before we even began to see symptoms? That is the hope of Dr. Shahar Arzy, Director of the Computational Neuropsychiatry Lab and Neuropsychiatry Clinic at the Hadassah Hebrew University Medical Center in Jerusalem, Israel, who received an AFA grant for a three-year study in the amount of more than \$400,000.

Dr. Arzy's work focuses on mental orientation, a distinct cognitive function which determines one's self-reference to "landmarks" in space (places), time (events) and person (people). Because the orientation system mechanisms overlap brain regions that are impaired in Alzheimer's, Dr. Arzy believes these weaknesses could be the core cognitive deficit that point to an early diagnosis.

In the pre-clinical stages of Alzheimer's, the orientation system begins to deteriorate, but people compensate by tapping into other resources like memory. It's only when both systems—orientation and memory—weakens that Alzheimer's becomes apparent and people seek help. Then it's too late for a potentially effective treatment.

To test his hypothesis, Dr. Arzy and his team designed cutting-edge computational and neuroimaging tests and a diagnostic app, called Clara, "clarity of mind," which can reveal the extent of an individual's loss of brain function in this area. Individuals are faced with a set of questions exploring their ability to determine where they are in relation to another place—closer to New York or London, for example; their orientation regarding time—whether President Kennedy was assassinated before President Obama was elected; and their ability to assess the closeness of a relationship—whether they are closer to their spouse or doctor. These assessments could establish a baseline in order to generate a

test tailored to them that could be a source of ongoing and early screening.

Clara is now in the second year of a five-year test at Harvard to compare data generated by the system with Alzheimer's markers identified via amyloid PET scan, quantitative and functional MRI and other neuropsychological tests. Assuta Medical Center in Tel Aviv has also been running a study this past year. Dr. Arzy envisions that Clara will be free to the public through doctors' offices and a mobile device or computer download. Pilot Android and web versions already support English, Hebrew, Chinese and Portuguese. More languages are in the works. ■



HEALTHY BRAIN RESEARCH NETWORK

Empowering Healthy Brain Scholars

The Scholars Program of the Healthy Brain Research Network (HBRN) trains and inspires the next generation of students who will be dedicating their careers to brain health and the increasing number of older Americans living with cognitive impairments as aspiring researchers, physicians, nurses, public health practitioners, social workers, epidemiologists, and more. Funded by the Centers for Disease Control and Prevention (CDC), the HBRN launched in 2014. But in fiscal year 2018-19, the HBRN faced a 20% funding

reduction. AFA stepped up with a \$150,000 grant to ensure that the national program would continue into its fifth year.

"The HBRN scholars program provides critically important training for the next generation of researchers who will address the needs of those with cognitive impairment as well as their caregivers," said Dr. Basia Belza, Principal Investigator who leads the HBRN Coordinating and Member Center at the University of Washington (UW).

Supported by the CDC Alzheimer's Disease and Healthy Aging Program, the HBRN draws upon the strengths of academic partnerships across six leading institutions: University of Washington, Oregon Health & Science University, University of Arizona, University of Illinois at Chicago, University of Pennsylvania, and the University of South Carolina.

During the reporting period, HBRN Scholar projects included the development and testing of an innovative sensor-based upper-extremity function (UEF) test for use in cognitive screening at the University of Arizona, a research review targeting Alzheimer's disease education programs at the University of South Carolina, and participation in data analysis and the development of a manuscript, *Training the Next Generation of Aging and Cognitive Health Researchers*, at the University of Illinois at Chicago.

All partner centers collaborated on two training webinars at UW for their multi-disciplinary audience, featuring a national panel of presenters and moderated by the scholars themselves. The webinars addressed innovative and interdisciplinary careers in aging and professional development (time management, scientific presentations, and mentoring). An interview-based e-publication called "Scholar Spotlight" also offered in-depth and personalized introductions to scholars and their work.

AFA funding also enabled the HBRN Scholars Program at UW to engage and mentor an additional graduate research assistant in the spring/summer 2019 academic term.

An adaption of her "Scholar Spotlight" interview follows. ■



Jenny Wool, BA

Master of Public Health Student
School of Public Health
University of Washington
HBRN Scholar
April-September 2019

Could you tell us about your background, and what drew you to this field?

My time as an undergraduate psychology major fostered an interest in cognitive and brain functioning as well as emotional health and well-being, but I had never explored these interests in relation to older adults specifically until the first year of my Master of Public Health program. During a health promotion

course, I had the opportunity to work as part of a team of four students to create an intervention on a topic of our choosing. Over the course of two months, we designed a hypothetical intervention to reduce perceived social isolation in low-income older adults. . . . I am excited to contribute to research that will fill in some of these gaps.

What's a recent accomplishment you'd like to brag about?

One of the HBRN projects I am currently working on is a qualitative research study focused on better understanding the lives of older adults with mild cognitive impairment (MCI). I've been spearheading recruitment efforts for the past two months, but this population is small and difficult to reach. I'm happy to say some of our recruitment efforts paid off, as we were able to more than double participant enrollment.

What opportunities have you had to collaborate with other HBRN Scholars and with the HBRN more broadly as part of your work?

Though I've only been with the HBRN a few months, I have already had opportunities to utilize HBRN connections. I consulted with HBRN members at Oregon Health & Science

University regarding strategies for our recruitment efforts for a qualitative research project. I've been so impressed by everyone's willingness to collaborate and provide ideas and suggestions for improving our research and recruitment strategies.

Based on your time as an HBRN Scholar, how do you see yourself contributing to the field?

One way I hope to contribute to the field is by being an advocate. While most people know about dementia and severe forms of cognitive impairment, many are not as familiar with mild cognitive impairment and what this diagnosis means or how it presents. I hope to promote awareness of this condition both within the field of healthy aging and beyond.

How has the Healthy Brain Research Network contributed to your career goals?

I hope to pursue a career in applied social science research, and the experiences I have gained thus far with participant recruitment and with qualitative research methods have provided invaluable learning opportunities. Additionally, I am learning about how to develop and maintain relationships with community partners, as well as

how to conduct community-based research. I feel very fortunate to be working with HBRN researchers who are true models in conducting this type of research.

What areas of work would you like to be involved in over the next year or two?

One of my research interests is sleep, and I am interested in exploring connections between sleep and cognitive impairment. I am also interested in food systems and access, and I hope to be able to conduct research in this area in my next year of graduate school.

What keeps you motivated to do the work that you do?

I firmly believe in the importance of the projects I am (or will be!) involved in with the HBRN. The qualitative research project I am currently working on can contribute to a better understanding of what daily life with MCI looks like, as well as promote awareness of it as a condition by highlighting participant stories and perspectives. I am also assisting with a summer piloting of a screener for social isolation. Social isolation is a significant public health issue, and finding effective tools to screen for social isolation has the potential to improve health impacts. ■



ALZHEIMER'S FOUNDATION OF AMERICA

GIFT of HOPE SOCIETY

A Special Invitation From

Bert E. Brodsky
Founder & Board Chair

Charles J. Fuschillo, Jr.
President & CEO

INVEST IN HOPE

More than 5.7 million people are living with Alzheimer's today. This number is expected to nearly triple by 2060 if new treatments or a cure are not found.

Philanthropic support enables AFA to push the field forward, provide innovative research and enrich the lives of those with Alzheimer's and their caregivers.

Make a gift of \$1,000 or more for programs, better treatment and a cure and become a member of AFA's Gift of Hope Society.

JOIN AFA'S NEW GIFT OF HOPE SOCIETY TODAY

SPECIAL BENEFITS

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Make your gift online at www.alzfdn.org/donate or use the enclosed envelope.

CONTRIBUTIONS MAY BE DESIGNATED FOR:



\$100,000 Founder's Club	\$75,000 President's Circle	\$50,000 Visionary	\$25,000 Creator	\$10,000 Innovator	\$5,000 Ambassador	\$2,500 Guardian	\$1,000 Friend
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Gift of Hope members who contribute \$10,000 or more will receive a special invitation to the annual roundtable meeting of the AFA Medical, Scientific & Memory Screening Advisory Board.

Naming opportunities are available for programs and special initiatives.

Reach out to Charles Fuschillo, AFA President & CEO, at cfuschillo@alzfdn.org, or our development office at 866-232-8484.

100% of all contributions designated for research go exclusively for funding research.

88% of all other contributions go to programs and services.

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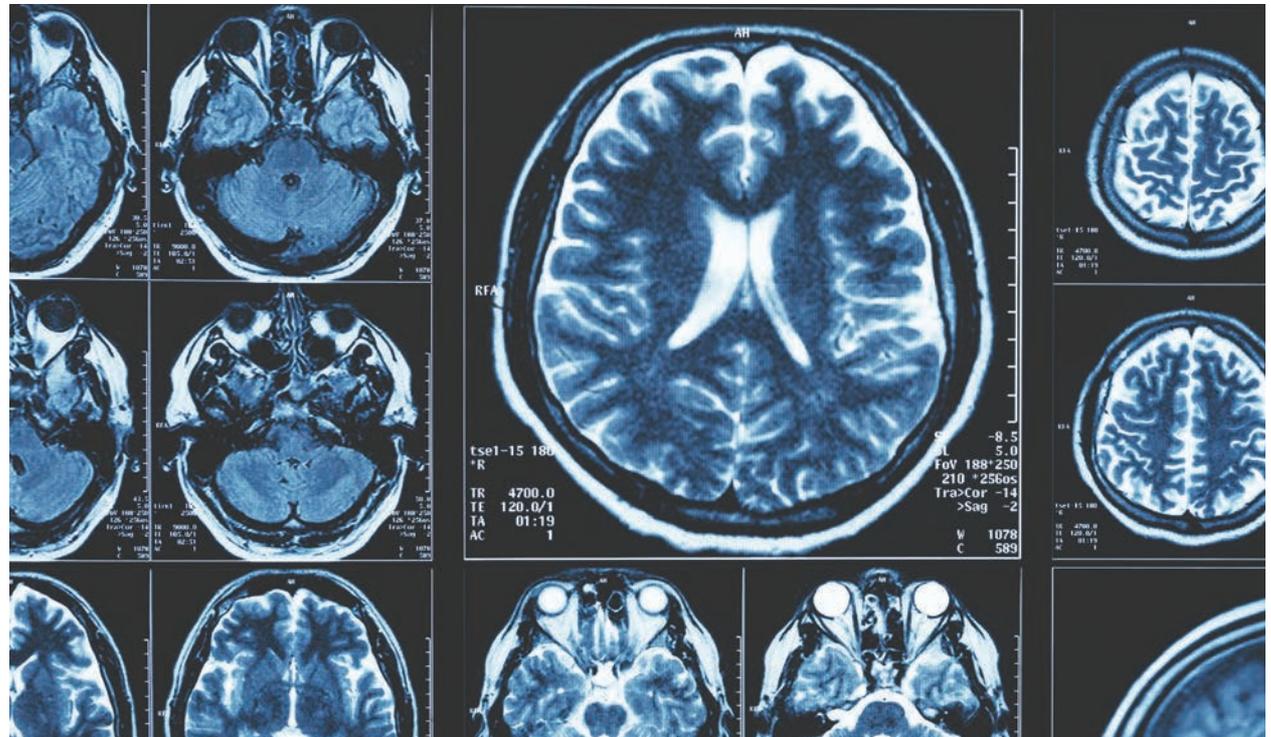
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“The discovery and development of new treatments for Alzheimer’s disease will *only* come from dedicated, focused research. There is no other way we will ever beat this awful disease. New developments in neuroscience and molecular biology have greatly increased the pace of research, and we will arrive at the answer. It is not a question of if we will succeed, but of when. We simply won’t quit until we do.”

—Peter Davies, PhD, Director,
Litwin-Zucker Center for the Study
of Alzheimer’s Disease and Memory
Disorders at The Feinstein Institutes
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