Finding Ways to Prevent, Slow and Stop Alzheimer’s Disease

Nantz National Alzheimer Center at Houston Methodist | 2021 Report
At the Nantz National Alzheimer Center, our lab was the first to link excess tau protein to Alzheimer’s disease brain dysfunction and to map tau progression in dementia, redefining how neurologists approach the illness. We were the first to identify how brain inflammation precedes brain degeneration. We believe our next first will help us find the first truly effective, personalized treatments for those suffering from this devastating disease.
Hello Friends!

My father, the late Jim Nantz Jr., was stricken with Alzheimer’s disease in the 1990s and suffered from the disease for 13 years. My dad received outstanding care at Houston Methodist, where I forged a close relationship with his primary physician, Dr. Stanley Appel. When my father passed, I knew there was something that we could do together to honor him.

On January 19, 2011, my wife Courtney and I launched the Nantz National Alzheimer Center (NNAC) at Houston Methodist with Dr. Appel. We did so with the belief that other families shouldn’t have to experience the pain, fear and loss associated with Alzheimer’s disease like we did. We are closer to realizing that vision, and we are doing so because of you.

Your endearing support translates into our highly skilled doctors and scientists finding new ways to tackle a disease that has stumped so many health care professionals. Your philanthropic gifts equal more sound research, better care and new therapies.

By supporting the NNAC, you join our journey to find answers and provide hope to the almost 6 million Americans diagnosed with Alzheimer’s disease. On behalf of the patients and families who will benefit from the research underway at the NNAC, thank you for your compassion and generosity.

With great appreciation,
Jim Nantz
Alzheimer’s disease is the sixth leading cause of death in the U.S. and is the source of much suffering, particularly for the families of the patients. To address this dreadful disease, Courtney and Jim Nantz — in partnership with Dr. Stanley H. Appel, the co-director of the Houston Methodist Neurological Institute and the Peggy and Gary Edwards Distinguished Chair in ALS Research — founded the Nantz National Alzheimer Center at Houston Methodist in 2011. A world-renowned research and referral center, the NNAC treats thousands of patients each year. Doctors at the NNAC provide personalized care for patients and their families, and conduct critical research in Alzheimer’s disease and other memory disorders.

By providing philanthropic gifts to support the center, you have helped our researchers leverage those funds to garner prestigious grants from philanthropic organizations and the government. Federal and other public grants are vital to ensuring our research moves to the next phase, but it is your contributions that champion our innovative approaches. You help our research team find medical breakthroughs more quickly.

“Although we have received public grant support, most of the groundbreaking research we have done and continue to do at the NNAC has been funded by philanthropy. Without this research, we could not have applied for public funding. Furthermore, it is innovative research — from an out-of-the-box mindset — that has yielded cures for diseases previously thought of as incurable.”

Dr. Joseph C. Masdeu
Director, Nantz National Alzheimer Center
ALZHEIMER’S DISEASE KILLS
more people than breast cancer and prostate cancer combined

ONE IN THREE
seniors dies with Alzheimer’s or another form of dementia

EVERY 65 SECONDS, SOMEONE
in the U.S. develops Alzheimer’s disease

In 2019, Alzheimer’s and other dementias cost the nation $290 BILLION

BY 2050, NEARLY 14 MILLION
Americans are expected to have Alzheimer’s disease

*Facts provided by the Alzheimer’s Association
Research Roundup

Research at the NNAC has resulted in the following contributions in understanding Alzheimer’s disease:

1. **Rather than amyloid, tau deposition in the brain is closely associated with neurodegeneration (figure 1.1).** Our study clarified the role of excess amyloid and tau in the brains of people with Alzheimer’s disease. These two proteins define two different stages of the disease, and measuring them in the brains of people is critical in selecting the appropriate medication to treat patients at their current disease stage. Previous clinical trials failed to identify the importance of tailoring a patient’s treatment to their specific disease stage. Therefore, they didn’t produce the desired results. Patients at the Nantz National Alzheimer Center can benefit from sophisticated brain imaging to define the stage of their disease, resulting in tailored therapeutic options.

2. **Pathological, toxic tau is passed from diseased neurons to healthy neurons, spreading neuron toxicity and worsening disease (figure 2.1).** Tau protein is important to healthy neuron function, but having a disease can alter tau structure and make it toxic instead. Pathological tau in diseased neurons is carried through a normal transport system used in healthy brains. Stopping pathological tau could stop the progression of disease.

   This discovery stimulated the use of antibodies directed against pathological tau as a treatment for Alzheimer’s disease. The subtle structural difference between toxic tau and healthy tau can be detected by antibodies, enabling us to target pathological tau while preserving healthy tau to carry on proper neuron function.
Researchers at the NNAC are characterizing and using imaging biomarkers of brain inflammation (figure 3.1). Brain inflammation is being measured at the NNAC by means of positron emission tomography (PET) tracers that bind to a protein called TSPO expressed by microglia, which are the inflammatory cells of the brain. The NNAC is one of only a few centers in the world using this important measurement. We have demonstrated that inflammation behaves like a forest fire in dementia, moving from “burned” tissue to healthy tissue. Researchers in Dr. Appel’s lab have shown that the blood in the patients with Alzheimer’s disease has altered immune cells.

For more information about the NNAC’s current research and clinical trials, please visit houstonmethodist.org/NNAC-research

Based on these findings and findings from other Alzheimer’s disease centers, physician-scientists and scientists in the NNAC are currently conducting clinical trials that test potential medications to:

1. Reduce brain amyloid in the brains of cognitively unimpaired people with amyloid buildup (A4 and A3-A5 studies*)
2. Reduce brain amyloid in early mild cognitive impairment (Biogen aducanumab study)
3. Reduce tau in the brains of people with early Alzheimer’s disease
   a. AbbVie study
   b. Biogen Tango study
   c. Lilly Periscope study
4. Reduce inflammation in the brains of people with early Alzheimer’s disease through the use of immunotherapy (immune modulating drug study)
Unlocking Alzheimer’s
Piecing Together the Puzzle
As we learn more about Alzheimer’s disease, it has become clear that the disease is not uniform and that its causes vary. At the NNAC, we have launched a groundbreaking study that will lead us to incorporating a precision medicine approach to fully understand an individual’s brain and metabolic and genetic factors associated with Alzheimer’s disease.

By means of MRI and PET, we will characterize brain changes in people who are cognitively unimpaired and those who have Alzheimer’s disease. We will map their entire genomes and determine more than 1,000 chemical compounds in the blood that are likely to disclose novel disease mechanisms (“metabolomics”). By using artificial intelligence tools, we can analyze the data. This important study is called the Houston Alzheimer’s Study and is being conducted in collaboration with researchers from Baylor College of Medicine, The University of Texas Health Science Center at Houston and the Michael E. DeBakey VA Medical Center.

Your vital support has helped us advance promising pre-clinical, clinical and biomarker research programs focused on novel therapeutic targets and innovative approaches for the treatment and prevention of Alzheimer’s disease and related dementias. Your renewed support will allow us to make tremendous strides as we conquer a disease that affects almost 6 million Americans each year and approximately 44 million people around the world.
The Nantz National Alzheimer Center — built on the seminal work of Dr. Gustavo C. Román, the Alzheimer Center founding director and current co-director — was established in 2011. Since then, it has become a first-class, internationally recognized center for the treatment and research of diseases leading to cognitive impairment. Currently, the NNAC has four full-time neurologists who care for thousands of patients annually. As a result, the NNAC is a leading recruiter among 20 centers involved in an NIH-funded study to research the natural history of early-onset cognitive impairment.

The NNAC is the only center in the Southwest that is part of a prestigious NIH-funded consortium of 18 institutions that will receive more than $63 million over five years to advance treatment options for frontotemporal lobar degeneration. Researchers at these centers are dedicated to finding genetic and other biomarker clues that may lead to the treatment of this type of dementia. The consortium will enable clinical trials. Moreover, the NNAC is the only Alzheimer’s center in the region with a dedicated frontotemporal dementia unit, directed by Dr. Belen Pascual.

To renew your support of the Nantz National Alzheimer Center, please visit NantzFriends.org or call the Houston Methodist Hospital Foundation at 832.667.5816.
Dr. Stanley H. Appel is an internationally renowned researcher and neurologist, and one of the nation’s foremost experts dedicated to treating patients with ALS. He is the director of the first MDA/ALS Research and Clinical Center in the U.S. established at Houston Methodist Hospital in 1983.

Dr. Appel’s laboratory was the first to document that regulatory T-lymphocytes modulate disease progression in ALS patients. His lab continues to develop new insights into ALS, Parkinson’s disease and Alzheimer’s disease. He currently focuses on enhancing the protective immunity of T-reg cells and anti-inflammatory microglia in neurodegeneration.

Dr. Appel has written 15 books and more than 400 articles. His achievements include the Gold Medal for Excellence in Biomedical Research from Columbia College of Physicians and Surgeons, the Texas Neurological Society Lifetime Achievement Award and the John P. McGovern Compleat Physician Award.

Dr. Joseph C. Masdeu trained in psychiatry at the University of Valencia in Spain and in neurology at Mt. Sinai Hospital in Chicago. He then served as a fellow in neuropathology at Peter Bent Brigham Hospital at Harvard Medical School. He was an assistant and associate professor of neurology at the Albert Einstein School of Medicine in New York, and served as a professor and chair of neurology at New York Medical College. Dr. Masdeu became a professor and chair of neurology and neuroscience at the University of Navarre Medical School in Pamplona, Spain. From 2008-2014, Dr. Masdeu was a senior staff physician and scientist in the Section of Integrative Neuroimaging of the Clinical Brain Disorders Branch at the National Institutes of Health.

He is chair of the Neuroimaging Research Group of the World Federation of Neurology. He was a director of the American Academy of Neurology, president of the American Society of Neuroimaging and editor. Since 2007, he has been editor in chief of the Journal of Neuroimaging. He is the author of 144 peer-reviewed papers, 62 book chapters and seven books, including Localization in Clinical Neurology, a standard in the field now in its seventh edition. Dr. Masdeu joined the NNAC and Houston Methodist Research Institute in 2014.