

## **Penn Researcher Virginia M.Y. Lee, PhD, Awarded Prestigious \$3 Million Breakthrough Prize**



We are proud and pleased to congratulate Virginia M.Y. Lee, PhD, Director of Penn's Center for Neurodegenerative Disease Research (CNDR), on receiving one of this year's international Breakthrough Prizes in Life Sciences for her outstanding contribution to neurodegenerative disease research. This award recognizes her groundbreaking discovery revealing tau tangles as a hallmark of Alzheimer's disease.

"It is an honor to receive such a prestigious award, and this funding will help us as we continue to push for a greater understanding of these diseases that can ultimately help us find ways to help millions of these patients," Lee said in the official Penn Medicine News Release.

"The Breakthrough Prize in Life Sciences honors transformative advances toward understanding living systems and extending human life. The prize was founded in 2013. It is sponsored by Sergey Brin, Priscilla Chan and Mark Zuckerberg, Pony Ma, Yuri and Julia Milner, and Anne Wojcicki ([breakthroughprize.org](http://breakthroughprize.org))."

Dr. Lee and her fellow awardees will be recognized at the eighth annual Breakthrough Prize gala awards ceremony Sunday, November 3, at NASA Ames Research Center in Mountain View, California, and broadcast live on *National Geographic*.

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## PENN MEDICINE'S 8th ANNUAL

**5K FOR THE IOA & THE MEMORY MILE WALK**

On Sunday, September 22, 2019, over 450 runners and walkers of all ages made their way to Penn Park for Penn Medicine's 8th Annual 5K for the IOA & The Memory Mile Walk.

The event raised nearly \$40,000 for Alzheimer's and aging-related research and care at Penn's Institute on Aging (IOA), with donations still rolling in days later. The funds raised help support the IOA Pilot Program which awards research grants to next generation scientists working on aging-related studies. This year, IOA Pilot Awardee Lauren Massimo, PhD, CRNP took the stage to share a few words on how the pilot program has helped shape her current study, *Evaluating Time Out: An intergenerational respite, training, and mentorship program*.

Penn Medicine's 5K for the IOA and the Memory Mile Walk was created eight years ago by Patrick J. Brennan, MD, Chief Medical Officer and Senior Vice President of the University of Pennsylvania Health System. "I started the 5K for the IOA because of my own personal experience and my family's experience with my father's death from Alzheimer's – and following that I wanted to try to do something to help," said Dr. Brennan during an on-air interview with PHL17. "Knowing the [directors] of the Institute on Aging and the Center for Neurodegenerative Disease Research at Penn, Drs. Virginia Lee and John Trojanowski, I decided I'd try to help them through research."

More coverage, including the full list of race winners, is available online.



**"The funds that we raise through the 5K for the IOA all go into novel research ideas – new ideas that generally young investigators develop but don't yet have enough information to get significant funding from NIH or from industry, so this helps them get started, get some new data, and then acquire new research support."**

– Dr. Brennan, 5K for the IOA creator

## THE CONNECTION BETWEEN ALZHEIMER'S DISEASE AND RELATED DEMENTIAS

The Center for Neurodegenerative Disease Research (CNDR) at the University of Pennsylvania has received a grant from the National Institute on Aging (NIA) expected to total \$18.1 million to study the connection between Alzheimer's Disease, dementia, and Parkinson's Disease.

The research will look at the underlying genetic mechanisms that cause these diseases to progress, as well as how those mechanisms are related to each other and to the cell-to-cell spread of the disease proteins.

Alzheimer's, dementia, and Parkinson's disease are often associated with each other. Previous research from CNDR has shown a connection not only with the association of Alzheimer's disease plaques and tangles, but also with a protein called alpha-synuclein.

"Our theory is that specific misfolded shapes of these alpha-synuclein proteins can lead to specific, different diseases. For example, one pattern may be associated with Alzheimer's, another with Alzheimer's and dementia, another with Parkinson's and dementia, and so on," said John Q. Trojanowski, MD, PhD, IOA Director and principal investigator on the grant.

Dr. Trojanowski and his team will test their theory through four specific projects. The first project, led by Virginia M.-Y. Lee, PhD, Director of CNDR, will evaluate alpha-synuclein in test tubes and cell cultures in an effort to better understand how misfolding happens and how specific shapes are created. The second, led by Trojanowski, will mimic Project One in animal models to study the impact of these shapes on the progression of disease.

The other two projects will move the work into the clinic. Project Three, led by Murray Grossman, MD, a professor of Neurology, will use imaging and antibodies to study how a patient who begins with Parkinson's progresses to dementia and vice-versa -- focusing on the potential identification of biomarkers. Finally, the fourth project, led by Alice S. Chen-Plotkin, MD, Parker Family Associate Professor of Neurology, will focus on tissue samples in an effort to identify genetic risk factors for these diseases.

## A TOOL TO HELP DIAGNOSE & TRACK PARKINSON'S DISEASE

A recent Penn Medicine news release has announced the news that researchers in the Perelman School of Medicine at the University of Pennsylvania will lead a multi-institutional effort in pursuit of developing a critical tool for imaging the brains of patients with Parkinson's and other neurodegenerative diseases. The Center Without Walls — a collaboration between Penn Medicine, Washington University-St. Louis, the University of Pittsburgh, the University of California-San Francisco, and Yale University — has received a five-year \$20 million grant from the National Institute of Neurological Disorders and Stroke (NINDS) to pursue this work.

Currently, there is no single test available to diagnose Parkinson's disease and it can go undetected or misdiagnosed until its symptoms — tremors, changes in speech, and balance issues — become severe. Identifying a Parkinson's imaging biomarker, or indicator of the disease process, would be a critical step for detecting the disease early, before irreversible damage to the brain occurs. Not only could a biomarker aid in early diagnosis, but according to study co-investigator Andrew Siderowf, MD, MSCE, the Hurtig-Stern Professor of Neurology at Penn, it could also allow researchers to speed clinical trials of new therapies.

With their funding, the researchers plan to develop two different radiotracers -- a drug that binds to certain proteins or sugars to show areas of the body that have higher levels of chemical activity. One tracer will bind to a protein in the brain known as alpha-synuclein for the imaging of Parkinson's and multiple system atrophy, and the other that will bind to the protein 4R tau for imaging frontotemporal degeneration and progressive supranuclear palsy.

Identifying compounds that are able to bind to the proteins alpha-synuclein and 4R tau is akin to "finding a needle in a haystack," said the Center's principal investigator Robert H. Mach, PhD, the Britton Chance Professor of Radiology at Penn Medicine. To accomplish this undertaking, a research group within the Center Without Walls, led by E. James Petersson, PhD, an associate professor of Chemistry, will use a technology that can computationally screen for molecules, synthesize them, and interpret binding data based on crosslinking.

The research team will also draw from the expertise of others here at Penn, including John Q. Trojanowski, MD, PhD, Director of the IOA, and Virginia M.-Y. Lee, PhD, Director of the Center for Neurodegenerative Disease Research (CNDR).

Mach says that a successful outcome from the Center Without Walls could not only change the course of Parkinson's disease research, but could have a much wider impact. "[It] would be a true paradigm shift in the way we develop molecular imaging probes to study neurological disease," he said.

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## EVENTS

**November 20, 2019 | 3:00 - 4:00pm**

**Visiting Scholar Series Seminar: Rhoda Au, PhD**  
*“The Path to Zero is One: Accelerating Innovation and Discovery through a Precision Brain Health Approach”*  
Biomedical Research Building (BRB) Gaulton Auditorium

**March 5, 2020 | Time TBD**

**Visiting Scholar Series Seminar: Nina Kohn, JD, Co-Sponsored by the Penn Memory Center**  
*Topic: Supported Decision Making*  
Clinical Research Building (CRB) Auditorium and Lobby  
*More details coming soon!*

**May 15, 2020 | 8:30am - 4:30pm**

**Sylvan M. Cohen Annual Retreat Co-sponsored by the Center for Neurodegenerative Disease Research**  
*Bringing the Microscope to Clinic: Crossing the Translational Divide from Basic Science to Clinical Research*  
*More details coming soon!*

## ANNOUNCEMENTS

### A CALL FOR PILOTS

**The FY 2021 IOA and Alzheimer’s Disease Core Center (ADCC) Pilot Award RFA is now available!**  
Applications due: February 3, 2020  
Learn more and download the RFA:  
[www.med.upenn.edu/aging/PilotAwards.html](http://www.med.upenn.edu/aging/PilotAwards.html)

### Make a Gift

To support aging-related research and care at the IOA, please contact:  
**Elizabeth Yannes, Penn Medicine Development**  
[elyannes@upenn.edu](mailto:elyannes@upenn.edu) | 215-573-4961

### Need More IOA + Aging-related News?

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### Become a Fellow

Learn more about becoming an IOA Fellow or Associate Fellow at:  
[www.med.upenn.edu/aging/fellows.html](http://www.med.upenn.edu/aging/fellows.html)

### IOA TEAM

**John Q. Trojanowski, MD, PhD** · Director  
**F. Bradley Johnson, MD, PhD** · Associate Director  
**M. Kathryn Jedrzewski, PhD** · Deputy Director  
**Nicolette Calcavecchia** · Digital Media Specialist  
**Ebony Fenderson** · Financial Administrative Coordinator  
**Elizabeth Yannes** · Penn Medicine Development

The mission of the Institute on Aging (IOA) at the University of Pennsylvania is to improve the health of older adults by increasing the quality and quantity of clinical and basic research as well as educational programs focusing on normal aging and aging-related diseases across the entire Penn campus.

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