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MONDAY, OCTOBER 17, 2022

# Path to test, treat disorders expands

NIH chooses Johns Hopkins, Howard universities to lead incubator for Alzheimer's, Parkinson's and more

By Meredith Cohn

As the coronavirus pandemic was upending daily life across the globe in early 2020, government officials challenged scientists to swiftly develop accurate and easy-to-use tests for COVID-19.

It was a break in the traditional slog from idea to marketable medical tool. The effort, which included funding and support, proved so successful that it's now a format for a new initiative funded by the National Institutes of Health. This time, it's focused on tests and treatments for neurological disorders such as Alzheimer's and Parkinson's diseases and migraines.

NIH chose the Johns Hopkins University in Baltimore and Howard University in Washington to lead a new incubator where scientific innovators can receive funding and mentoring from a diverse set of expert scientists and engineers for ideas that are at such an early stage that the government wouldn't normally take the risk.

The center, called NeuroTech Harbor, solicited the first pitches at the end of September. The university experts will select the innovators from a broad pool of applicants to the incubator and "polish" their projects to present to NIH, which will ultimately choose those getting ongoing funding, said Sri Sarma, executive director of the new center and associate professor of biomedical engineering at Johns Hopkins.

"Potentially lifesaving and life-changing solutions addressing neurological conditions are out there, but the pace of their development is slow," Sarma said.

"Many of the most promising concepts often languish due to a lack of resources and the high risks associated with early development phases," she said. "NeuroTech Harbor's approach will overcome those barriers, helping to fast-track solutions to conditions that affect 1 in 6 people around the globe."

Diagnostic tools and treatments vary for the neurological disorders: Alzheimer's, migraines and Parkinson's, as well as multiple sclerosis and strokes. Together they affect more than a billion people worldwide.

NeuroTech Harbor expects hundreds of applications over five years, and the winners will get up to \$500,000 a year for three to four years. Up to eight teams could be chosen this year.

The funding comes from the National Institutes of Health's Blueprint MedTech: Incubator Hubs program, which works to accelerate development of medical devices for nervous system disorders. The NIH neurological program is also funding another incubator led by Boston-area medical and academic institutions, which previously headed COVID-19 test development.

The Hopkins-Howard team believes it was added because of its commitment to diversity among innovators, which aims

## NIH

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not only to widen the pool of scientists and ideas, but to reduce disparities in treatment for neurological disorders.

"There are innovators across all populations, people who have ideas to solve problems and expand the reach of products to communities that are disadvantaged," said Dr. Evaristus Nwulia, a professor of neuroscience and director of the Translational Neuroscience Laboratory in the Howard University College of Medicine.

"A lot of people are underrepresented on the research side, including minorities, but this also includes women," he said. "They have limited access to resources to help them develop effective products to address these problems and move their ideas out into society. And on the other side, some can't access the products or they don't work for them. These underserved populations include people in rural areas."

Nwulia said Howard, a historically Black research university, also will work to expand the pipeline of new ideas and new innovators with programs that go beyond the contours of the NIH program because they lack enough basic research or have another missing piece. A "seedling" program will offer some funding and mentorship to those projects so they can "resolve the weakness" and remain viable. Another program headed at Howard will mentor a diverse corps of young people as a pipeline for future researchers.

"Diversity unlocks innovation, thinking outside the box and makes the broadest impact," Nwulia said.

There is a lot riding on such efforts, with uneven development of diagnostics and therapies for the diseases. Sarma said scientists, for example, don't really understand the mechanism behind migraines. More is understood about Parkinson's, and when drugs fail, patients have gotten relief from symptoms like tremors through deep brain stimulation. That's the use of implanted electrodes to provide electrical stimulation to disrupt abnormal electrical signals in the brain associated with movement disorders.

Alzheimer's drug development may be among the most disappointing over time with drug failures in clinical trials and even questions about the path researchers have

taken to remove proteins called amyloids that form plaque in patients' brains. This plaque has long been a hallmark of the disease, though researchers don't fully understand its role.

The U.S. Food and Drug Administration recently approved one drug called aducanumab over objections from outside advisers. Aducanumab removes the plaque with the aim of slowing cognitive decline in patients with early onset Alzheimer's, but the drug requires high doses that can cause side effects and is costly.

The outside experts were more hopeful about another drug, lecanemab, which showed a 27% decrease in cognitive decline in its latest trial. But they also questioned whether the benefit was enough and worth the potential side effects and cost.

Nwulia added that the benefits of this and other drugs may vary among populations because of age, race or ethnicity or other factors that have not yet been determined.

The pharmaceutical industry, as well as other government, private and academic institutions continue to explore ways of addressing all the neurological disorders.

In the Baltimore region, others taking up research include the Kennedy Krieger Institute and the University of Maryland School of Medicine.

Maryland is in the final stage of plans for an institute that aims to facilitate collaborative research across the campus of the University of Maryland, Baltimore. It will focus on neuroinflammation and injury, neurodevelopment and autism, and the aging brain. The aging category includes neurodegeneration and dementia.

"Our institution has tremendous strengths around neuroscience, and now is the ideal time to create interdisciplinary teams in a new institute to accelerate the discovery and translation of novel therapies and offer new hope for patients," said Dr. Mark T. Gladwin, the new dean of the University of Maryland School of Medicine.

"There is an urgent need to better understand how the brain develops and ages and responds to inflammatory and traumatic injury," he said. "Alzheimer's disease and related dementias currently afflict more than 5 million Americans and represent one of our great generational challenges associated with the aging of the world's populations."

## Remembering the lives lost to coronavirus

As the number of coronavirus deaths rises, The Baltimore Sun is working to chronicle those who have lost their lives in the Baltimore area or who have connections to our region. Submit information at [baltimore.sun/coviddeath](mailto:baltimore.sun/coviddeath) or contact us at 410-332-6100 during regular business hours.