Scientists discover way of developing test for Parkinson's disease diagnosis

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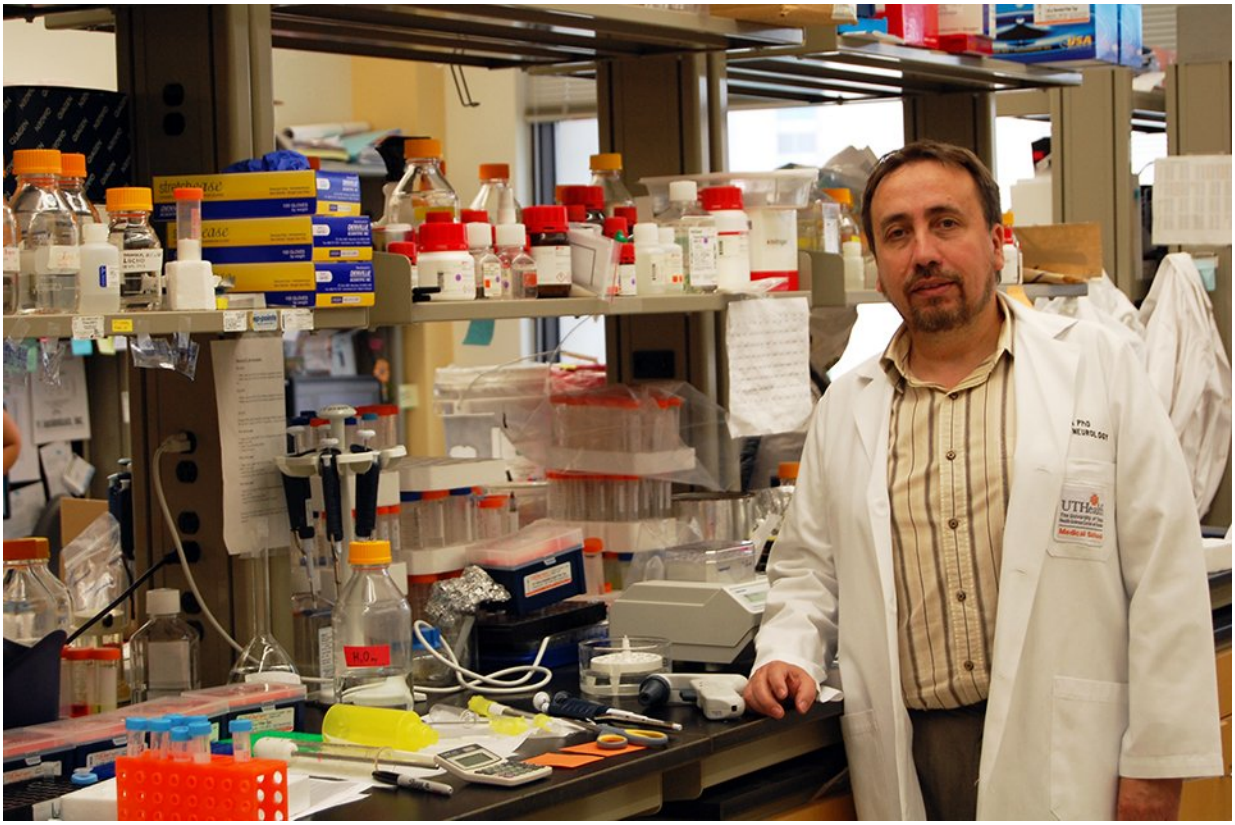

Claudio Soto, Ph.D. Credit: University of Texas Health Science Center at Houston

Misfolded proteins associated with Parkinson's disease were detected in cerebrospinal fluid by scientists at McGovern Medical School at The

University of Texas Health Science Center at Houston (UTHealth), paving the way to development of a biochemical test to diagnosis the disease.

The research, led by Claudio Soto, Ph.D., professor in the Department of Neurology and the director of the George and Cynthia Mitchell Center for Alzheimer's disease and Related Brain Disorders at UTHealth, was published in yesterday's issue of *JAMA Neurology*, a journal of the American Medical Association.

Parkinson's disease (PD) is a degenerative disorder of the brain that initially affects motor skills, causing tremors, stiffness, slowness of movement and impaired balance. As it progresses, patients may develop cognitive problems, psychiatric alterations and dementia. There are no current laboratory or blood tests that have been proven to help in diagnosis. Because the disease can be difficult to diagnose accurately, diagnosis is sometimes is made by ruling out other neurological diseases.

Using a technology developed by Soto that was shown in previous studies to detect misfolded proteins associated with diseases such as Creutzfeld-Jacob and Alzheimer's disease, researchers targeted misfolded alpha-synuclein (aSyn) aggregates as a way of developing a sensitive biochemical diagnosis for PD. The Protein Misfolding Cyclic Amplification (PMCA) technology was able to detect very small amounts of the misfolded protein circulating in cerebrospinal fluid.

"Of significant interest is that the amount of aSyn detected correlates with the severity of the disease and in two of the control samples, aSyn was detected and those people later developed clinical symptoms of PD," Soto said.

The research included blind screenings of cerebrospinal fluid of two cohorts of 76 PD patients, as well as controls of 65 people who were

healthy or affected by other neurological disorders, 18 affected by neurodegenerative diseases and 14 affected by Alzheimer's disease.

Since cerebrospinal fluid is removed through spinal taps, which are invasive and painful, the hope is that future research would enable optimization of the PMCA assay to detect aSyn in blood or urine.

"The hope is that we could use aSyn-PMCA to detect PD in patients before they develop symptoms, and those patients could be entered into clinical trials for novel treatments that might prevent, cure or delay the progression of the disease before substantial and irreversible damage of the brain," Soto said.

More information: Mohammad Shahnawaz et al, Development of a Biochemical Diagnosis of Parkinson Disease by Detection of α-Synuclein Misfolded Aggregates in Cerebrospinal Fluid, *JAMA Neurology* (2016). DOI: 10.1001/jamaneurol.2016.4547

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