UC San Diego
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December 08, 2015 | By Bonnie Ward

UC San Diego Receives Michael J. Fox Foundation Grant to Identify Parkinson's Biomarkers

Parkinson's disease is difficult to diagnose, particularly in its early stages. Now, researchers at University of California, San Diego School of Medicine – aided by a $375,000 grant from The Michael J. Fox Foundation for Parkinson's Research (MJFF) – hope to improve the prospects of early diagnosis by identifying a biological signpost in the blood.

Currently, no standard diagnostic test exists for Parkinson's disease, a chronic and progressive movement disorder affecting nearly one million Americans. Instead, physicians use patient symptoms, medical history and a neurological exam to make their diagnosis.

"One of the really unmet needs with Parkinson's disease is the creation of a simple diagnostic test that can identify the disease early on," said UC San Diego School of Medicine study leader Paula Desplats, PhD, assistant professor in the Department of Neurosciences. "Like other neurodegenerative disturbances, by the time a Parkinson's patient has outward symptoms, many neurons are lost."

Earlier diagnosis would enable earlier treatment and hopefully delay neuronal damage and reduce disease symptoms, said Desplats, who is co-principal investigator on the study with Travis Dunckley, PhD.

The search for biomarkers – signs that can indicate the presence or progress of a disease – is a major push in Parkinson's research.

The novelty of the UC San Diego study is that researchers will investigate DNA methylation in the blood as a potential signature or biomarker of Parkinson's disease. DNA methylation is an epigenetic signaling mechanism used by cells to switch genes on and off, thereby affecting the cell's physiology.

"The most important thing in our study is identifying a biomarker that could be easily tested in the clinic," said Desplats. "You can't probe the brain of the patient; you need to be able to look at tissue that is easily accessible. So we began to investigate changes in methylation that can be read in blood."

Desplats' current study is predicated on two earlier, smaller studies in which she found distinct epigenetic changes in the blood of Parkinson's patients versus controls. One of those studies, involving 46 people in 2013-2014, was also funded by MJFF. The results were "highly sensitive and

specific," said Desplats. "We found a group of genes that, when taken together, show a particular pattern in Parkinson's disease. They (MJFF) invited us to continue."

The latest study involves a much larger cohort. Investigators will analyze blood samples from 216 Parkinson's patients and 216 healthy control subjects collected at baseline and at a visit two years later. The samples will be provided by the Harvard Neurodiscovery Biomarker Program, a study collaborator.

"This is the first longitudinal study of blood methylation for Parkinson's disease," said Desplats. "That's important because these changes may not only help us determine who has Parkinson's disease, but also help us monitor how a person is progressing in the disease."

The study will begin this month and is expected to report its findings in 2017.

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