

New tool could lead to earlier diagnosis, better treatment of Parkinson's disease

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Immunohistochemistry for alpha-synuclein showing positive staining (brown) of an intraneural Lewy-body in the Substantia nigra in Parkinson's disease. Credit: Wikipedia

Parkinson's disease is the second most common neurodegenerative

disorder in humans, after Alzheimer's disease. It is typically characterized by changes in motor control such as tremors and shaking, but can also include non-motor symptoms, from the cognitive to the behavioral. An estimated seven to 10 million people worldwide are living with Parkinson's disease, with medication costing approximately \$2,500 a year, and therapeutic surgery costing up to \$100,000 dollars, per patient.

Making an accurate diagnosis of Parkinson's, particularly in early stages and mild cases, is difficult, and there are currently no standard diagnostic tests other than clinical information provided by the patient and the findings of a neurological exam. One of the best hopes for improving diagnosis is to develop a reliable test for identifying a biomarker, i.e. a substance whose presence would indicate the presence of the disease.

Now, Suaad Abd-Elhadi, a PhD student at the Institute for Medical Research Israel-Canada (IMRIC) in the Hebrew University of Jerusalem's Faculty of Medicine, has developed the lipid ELISA. This novel diagnostic tool could lead to earlier detection of Parkinson's, along with better tracking of the disease's progression and a patient's response to therapy.

How the diagnostic ELISA works

ELISA stands for "enzyme-linked immunosorbent assay." An assay is a procedure used in laboratory settings to assess the presence, amount and activity of a target entity, such as a drug, cell or biochemical substance. ELISA is a common assay technique that involves targeting cellular secretions.

In the case of the lipid ELISA, the cellular secretion of interest is a specific protein called the alpha-Synuclin protein. This protein serves as

a convenient biomarker that is closely associated with the tissues where Parkinson's disease can be detected, along with the neurological pathways the disease travels along, causing its characteristic symptoms.

As a simple and highly sensitive diagnostic tool that can detect Parkinson's biomarkers, the lipid ELISA could lead to a minimally invasive and cost-effective way to improve the lives of Parkinson's patients. Recently, Abd-Elhadi has demonstrated a proof of concept to the high potential of this lipid-ELISA assay in differentiating healthy and Parkinson's affected subjects. She is now in the process of analyzing a large cohort of samples, including moderate and severe Parkinson's, and control cases, as part of a clinical study.

Provided by Hebrew University of Jerusalem

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