Detection of Post-Translationally Modified Proteins as a Biomarker Panel for Parkinsons Disease

https://neurodegenerationresearch.eu/survey/detection-of-post-translationally-modified-proteins-as-a-biomarker-panel-for-parkinsons-disease/

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Contact information of lead PI
Country

USA

Title of project or programme

Detection of Post-Translationally Modified Proteins as a Biomarker Panel for Parkinsons Disease

Source of funding information

NIH (NINDS)

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€ 1,223,306.42

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15/07/2016

Total duration of award in years

3

The project/programme is most relevant to:

Parkinson's disease & PD-related disorders

Keywords

biomarker panel, Parkinson Disease, alpha synuclein, Detection, Blood Tests

Research Abstract

DESCRIPTION (provided by applicant): Program Director/Principal Investigator (Walt, David, R): Project Abstract To date, research aimed at identifying a biomarker for Parkinson’s Disease (PD) has, for the most part, focused on measuring the levels of all isoforms of a given protein such as alpha-synuclein or DJ-1 in serum or CSF. These methods, however, have not had the sensitivity and specificity necessary to be used as an indicator of disease. Recent evidence suggests that specific post-translational modifications such as phosphorylation and ubiquitination are key to the pathophysiology of PD. These post-translationally modified proteins have not yet been measured in serum because the concentrations of these isoforms are likely below the limit of detection of conventional ELISAs. We hypothesize that the detection of post-translationally modified proteins will be critical to PD biomarker development. Therefore, we will use technology, newly developed in our lab, which is 100-1000 times more sensitive than traditional ELISA to detect these isoforms. This new technology, Single Molecule Arrays (SiMoA), is a digital ELISA that counts individual molecules in solution. This proposal seeks to develop SiMoAs specific for post-translationally modified proteins relevant to PD. We will create a simple blood test and assess its sensitivity and specificity using serum samples from PD patients, healthy controls and individuals with other movement disorders provided by the PDBP. In sum, this application seeks to create a biomarker panel that is sensitive, specific, noninvasive and substantially cheaper than current diagnostic methods.

Lay Summary

PUBLIC HEALTH RELEVANCE: This project is focused on creating a simple blood test for the detection of Parkinson’s disease. Our methodology involves detecting modified proteins relevant to the development of Parkinson’s using a novel, ultra-sensitive protein detection technology.

Further information available at:

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Investments > €500k

Member States:
United States of America

Diseases:
Parkinson's disease & PD-related disorders

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