Peptide Biomarkers for Parkinson Disease

https://www.neurodegenerationresearch.eu/survey/peptide-biomarkers-for-parkinson-disease/

Principal Investigators

ZHANG, JING

Institution

UNIVERSITY OF WASHINGTON

Contact information of lead PI
Country

USA

Title of project or programme

Peptide Biomarkers for Parkinson Disease

Source of funding information

NIH (NINDS)

Total sum awarded (Euro)

€ 2,437,288.99

Start date of award

01/01/2016

Total duration of award in years

5

The project/programme is most relevant to:

Parkinson's disease & PD-related disorders

Keywords

Parkinson Disease, deprenyl, Neural Cell Adhesion Molecule L1, Peptides, Cerebrospinal Fluid

Research Abstract

? DESCRIPTION (provided by applicant): Objective, reliable, and reproducible biomarkers are clearly needed to assist with accurate diagnosis of Parkinson disease (PD), especially at early stages, as well as for facilitating differential diagnosis and disease monitoring. The proposal is designed to meet several major challenges of current biomarker research, specifically: 1) significant variations associated with antibody-based protein assays, 2) low sensitivity and

specificity of blood based markers, and 3) detection of PD at early stages. To address the problems of antibody-based assays, our strategy is development of targeted mass spectrometry-based techniques, such as selected reaction monitoring (SRM), to identify unique peptide markers derived from proteins either showing promise in previous proteomics profiling, or known to be critical to PD pathogenesis, e.g., ?-synuclein, parkin and LRRK2, in human cerebrospinal fluid (CSF). To facilitate discovery and validation of blood based biomarkers, a specific population of central nervous system derived plasma exosomes, the cargo-carrying microvesicles recognized recently to transport biomolecules among different cells or organ systems, will be isolated before SRM analysis. The unique peptide markers will be tested in several large, well-established cohorts, e.g., Udall Centers affiliated with the University of Washington and University of Pennsylvania, DATATOP (Deprenyl and tocopherol antioxidative therapy of parkinsonism) and PPMI (Parkinson Progression Marker Initiative), with cross-sectional and longitudinal samples collected, along with extensive clinical characterization. Finally, to improve early diagnosis, we will make use of two cohorts consisting of subjects at elevated risk for PD (i.e., asymptomatic subjects with LRRK2 mutations or anosmia/hyposmia), with the goal of discovering biomarkers capable of identifying subjects with early or premotor PD. The studies designed for this project, if successful, have the potential to result in a panel(s of biomarkers that are robust, with less variation than can currently be achieved, and in a body fluid that is readily accessible in a regular clinical setting. Markers for early diagnosis and progression of PD are critical in understanding how to arrest or slow PD progression.

Lay Summary
PUBLIC HEALTH RELEVANCE: Parkinson disease (PD) affects over one million Americans and many more worldwide. The disease is also costly, with 25 billion dollars spent per year, not only to patients but also to our society. This study aims to examine key biomarkers related to PD pathogenesis in human cerebrospinal fluid (CSF) and blood, allowing for better understanding of PD diagnosis and progression as well as assessment of treatment effects.

Further information available at:

Types:
Investments > €500k

Member States:
United States of America

Diseases:
Parkinson's disease & PD-related disorders

Years:
2016

Database Categories:
N/A

Database Tags:
N/A