Early Detection of Parkinson’s Disease using Noninvasive Biomarkers

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## Background & Unmet Need

- Parkinson’s Disease (PD) is the second most common neurodegenerative disease, affecting 10 million people worldwide
- The presence of Lewy bodies, which are made up by aggregated \( \alpha \)-synuclein protein deposits, are a hallmark of PD
- Emerging diagnostics for PD measure levels of \( \alpha \)-synuclein in spinal fluid, which is collected from invasive lumbar punctures
- Lumbar punctures can be painful and put patients at risk for spinal fluid leakage, prolonged headaches, back pain, and bleeding
- It is currently difficult to accurately measure pathological \( \alpha \)-synuclein aggregates in living patients using non-invasive methods
- **Unmet Need:** Noninvasive biomarkers for early assessment of Parkinson’s disease

## Technology Overview

- **The Technology:** A method for early detection of Parkinson’s Disease using an imaging modality to measure a novel biomarker
- **The Discovery:** In a novel mouse model of PD, the inventor has discovered a new biomarker that is visually apparent using a readily available imaging modality
- The emergence of this biomarker temporally coincides with onset and progression of disease as well as Lewy body deposition, and could be used as a biomarker for PD detection
- **PoC Data:** In a mouse model of PD, diseased mice had significantly more expression of the biomarker (\( p<0.001 \)) than control mice starting at 2 months old
- The expression of the biomarker increases over time in diseased mice, matching PD disease progression

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**Inventor:** Ching-Hwa Sung  
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**Cornell Reference:** D-10740
Early Detection of Parkinson’s Disease using Noninvasive Microscopy Biomarkers

Technology Applications

• Early, noninvasive detection of Parkinson’s Disease
• Method of monitoring PD progression over time
• Method of assessing treatment efficacy during clinical trials
• Diagnosis of other neurodegenerative diseases involving aggregated α-synuclein deposition, such as Lewy body dementia

Technology Advantages

• Noninvasive, unlike current diagnostics that utilize spinal taps or biopsies
• Measures actual levels of pathological α-synuclein inclusions, rather than amplifying the quantity, enabling more accurate assessment of the disease
• Increased expression of the biomarker correlates to disease progression, allowing for better assessment of the state of the disease or treatment efficacy
• More cost effective than methods requiring sampling and assays for protein or nucleic acid levels

Supporting Data / Figures

Figure 1: Expression of biomarker increases over time, matching disease progression.

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