Weill Cornell Medicine

Early Detection of Parkinson's Disease using Noninvasive Biomarkers

Lead Inventor:

Ching-Hwa Sung

Professor of Cell and Developmental Biology, Cell and Developmental Biology, Weill Cornell Medical College

Professor of Cell Biology in Ophthalmology, Ophthalmology, Weill Cornell Medical College

The Betty Neuwirth Lee and Chilly Professor in Stem Cell Research, Ophthalmology, Weill Cornell Medical College

Business Development Contact:

Jeffrey James   (646) 962-4194

Associate Director, Business Development and Licensing   jaj268@cornell.edu

Early Detection of Parkinson's Disease using Noninvasive Microscopy Biomarkers

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 α-synuclein protein deposits, are a hallmark of PD
- Emerging diagnostics for PD measure levels of α-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 α-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 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

Inventor:
Ching-Hwa Sung

Patents:
Provisional Filed

Biz Dev Contact:
Jeffrey James
(646) 962-4194
jaj268@cornell.edu

Cornell Reference:
D-10740

Weill Cornell Medicine

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
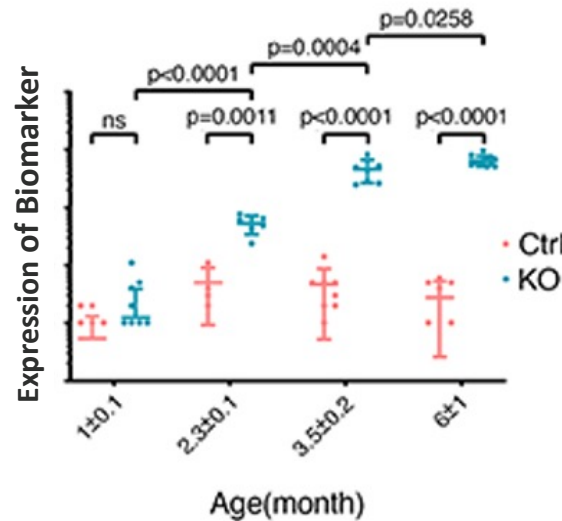
Supporting Data / Figures

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

Inventor:
Ching-Hwa Sung

Patents:
Provisional Filed

Biz Dev Contact:
Jeffrey James
(646) 962-4194
jaj268@cornell.edu

Cornell Reference:
D-10740

Weill Cornell Medicine