A robust biomarker for the diagnosis and treatment of Parkinson's disease

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Technology description

Summary

Parkinson's Disease (PD) is a devastating neurodegenerative disorder that is caused by the buildup of alpha-synuclein protein within neurons of specialized brain regions and leads to neuronal death in a manner that is not fully understood. Current diagnostic standards are largely observational and a widely accepted diagnostic test has remained elusive. This technology is a method for detecting a T cell-mediated immune response against alpha-synuclein that is specific to PD patients. While healthy individuals produce alpha-synuclein, they rarely exhibit an immunogenic reaction from T cells. In PD patients, T cell activation by alpha-synuclein leads to death of the neuron, implicating this immune response as a key step in disease progression. The technology represents a powerful biomarker for the presence and classification of PD.

Low cost, minimally invasive blood test with broad potential for future development

This technology is a simple, inexpensive method to diagnose PD or confirm a diagnosis, and has the potential to be further developed to monitor disease progression and the efficacy of novel therapies. The technology was developed using in vitro culture and in vivo rodent studies, validated using patient blood samples, and further confirmed with human autopsy results.

Advantages

Potential to be the first diagnostic test for Parkinson's disease
Could enable early intervention, as it would not require doctors and patients to wait for symptoms to advance in order to confirm a diagnosis
Simple and low-cost
Could prove to be an effective treatment for large populations of PD patients if the immune response is broadly targeted
Could lead to personalized treatment regimens and is expected to result in fewer side effects

Immune therapies currently in development for other autoimmune disorders such as type I diabetes and multiple sclerosis could be easily translated to target these PD T cell responses.

Institution

Columbia University

Inventors

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