Quanterix

PUBLICATION BRIEF

Parkinson's Disease (PD)

NEUROLOGY

Simoa® Immunoassays Enable Ultrasensitive Detection of Blood-Based Biomarkers for Parkinson's Disease

Parkinson's disease (PD) is a progressive and debilitating neurodegenerative disorder that affects millions of people worldwide. Therapeutic management can ease symptoms and slow progression, especially if implemented in the early stages of the disease. However, traditional diagnostic methods are limited to detecting motor deficits, which may not manifest until the later stages of the disease progression. This leaves a critical gap in identifying asymptomatic patients who could benefit most from early therapeutic intervention.

Recent advances in ultrasensitive quantification of neuro biomarkers in cerebrospinal fluid (CSF) and blood have opened up new avenues for detecting PD in its preclinical stages. Some of these biomarkers include neurofilament light chain (NfL), glial fibrillary acidic protein (GFAP), and tau. While neuroprotein concentrations tend to be higher in CSF than in other biofluids, blood-based biomarker detection methods are safer and more practical for routine use. However, detecting biomarkers at such low levels requires advanced technology capable of ultra-sensitive measurements.

Quanterix's blood-based immunoassay panels, including Simoa® Nf-light™, Simoa® GFAP, and Simoa® Tau, can reliably quantify candidate PD biomarkers at femtogram-level concentrations – far below the standard Lower Limit of Quantification (LLOQ) of typical immunoassays. This technology supports researchers in transforming our understanding of PD pathology and opens new doors for targeted therapeutic interventions.

Solutions to Advance Your Research

OPTIONS OF SIMOA®:

- *Purchase assays for use on the Quanterix SR-X™, or Simoa HD-X™ Analyzer platform*
- *Submit samples to our* Accelerator Laboratory *for analysis*
- *Measure NfL, GFAP, and tau proteins alone or simultaneously with our singleplex and multiplex assay options*

BENEFITS OF SIMOA®:

- *Access biomarker data with unparalleled sensitivity and accuracy*
- *Study health and disease with a less invasive approach*
- *Transform the way we detect diseases*
- *Advance scientific understanding of diseases like multiple sclerosis*

SR-X™ Biomarker Detection System
The first benchtop instrument to offer true multiplex detection at both acute and baseline levels.

HD-X™ Analyzer
Delivering fully-automated ultra sensitive biomarker detection you can count on.

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Simoa® Technology Enables Best-in-Class Research to Advance Scientific Breakthroughs in Parkinson's Disease

Quanterix's ultrasensitive Simoa® technology offers a non-invasive screening method to facilitate biomarker data generation and assist scientists and clinicians in their research. Below is a curated list of peer-reviewed publications that use Quanterix Simoa® technology in Parkinson's disease research.

A Panel of Plasma Biomarkers for Differential Diagnosis of Parkinsonian Syndromes
Frontiers in Neuroscience
doi: 10.3389/fnins.2022.805953

Plasma GFAP in Parkinson's disease with cognitive impairment and its potential to predict conversion to dementia
npj Parkinson's Disease
doi:10.1038/s41531-023-00447-7

Serum neurofilament is associated with motor function, cognitive decline and subclinical cardiac damage in advanced Parkinson's disease (MARK-PD)
Parkinsonism and Related Disorders
doi:10.1016/j.parkreldis.2021.07.028

Association of serum neurofilament light chain and glial fibrillary acidic protein levels with cognitive decline in Parkinson's disease
Brain Research
doi:10.1016/j.brainres.2023.148271

Validation of Serum Neurofilament Light Chain as a Biomarker of Parkinson's Disease Progression
Movement Disorders
doi:10.1002/mds.28206

Increased alpha-synuclein tear fluid levels in patients with Parkinson's disease
Scientific Reports
doi:10.1038/s41598-020-65503-1

Plasma Neurofilament Light Concentration Is Associated with Diffusion-Tensor MRI-Based Measures of Neurodegeneration in Early Parkinson's Disease
Journal of Parkinson's Disease
doi:10.3233/JPD-223414

High-Sensitivity Single Molecule Array Assays for Pathological Isoforms in Parkinson's Disease
Clinical Chemistry
doi:10.1093/clinchem/hvab251

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