

Neurological and inflammatory Fluid Biomarkers of Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) and Long-COVID

Grant Amount	£32,149.30
Location	UK Dementia Research Institute's Fluid Biomarker Laboratory at University College London (UCL)
Research Field	Biomarker Discovery
Lead Researcher/s	Miss Sophie Hicks, under the supervision of Dr Amanda Heslegrave, Dr Michael Zandi, Professor Henrik Zetterberg
Start Date	01/12/2025
Duration	18 months
Status	In Progress
Latest Update	Research Update: Biomarker Study for ME/CFS and Long Covid Now Underway

BACKGROUND

Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) and Long Covid are debilitating, multi-system illnesses affecting nearly two million people in the UK. Despite their impact, there are still no validated diagnostic tests for either condition. Diagnosis relies on clinical history and the exclusion of other illnesses, which can lead to long delays, uncertainty, and misdiagnosis.

One of the most promising avenues for progress is the discovery of biological "markers" in blood — known as biomarkers — that reflect underlying disease processes. Biomarkers have transformed diagnosis and treatment in other neurological conditions, including Alzheimer's disease, where blood-based markers now support earlier and more accurate diagnosis.

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However, biomarker research in ME/CFS and Long Covid face two major challenges:

- Sensitivity: Many potentially important molecules are present at extremely low levels and cannot be detected using standard laboratory methods.
- Specificity: Some biomarkers reported in previous studies are not unique to ME/CFS or Long Covid, making it difficult to distinguish between conditions with overlapping symptoms.

This new study aims to overcome these challenges using an advanced, highly sensitive technology capable of measuring hundreds of neurological and inflammatory proteins at once.

PROJECT OVERVIEW

This pilot study will be carried out at the UK Dementia Research Institute's Fluid Biomarker Laboratory at University College London (UCL). The research team will analyse plasma samples from:

- People with ME/CFS
- People with Long Covid
- Healthy controls

Samples will be sourced from the UK ME/CFS Biobank and the UCLH STIMULATE ICP Long Covid study, ensuring high quality, well characterised cohorts.

The project will use ALAMAR Bioscience's NULISA platform, a next generation technology with extremely high sensitivity. It can detect more than 300 proteins involved in immune function and central nervous system processes — including many that cannot be measured using standard immunoassays (a simple test that used antibodies to detect something present in a sample, such as a protein).

The study will explore:

- Biomarkers that may be specific to ME/CFS

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- Biomarkers that may be specific to Long Covid
- Shared biological signatures between the two conditions
- Links between biomarker patterns and symptoms such as brain fog, headaches, muscle pain, and other clinical features

Data will be analysed using statistical and machine learning approaches to identify meaningful patterns and potential diagnostic signatures. Findings will be prepared for publication in a peer reviewed journal and used to support future, larger scale validation studies.

IMPORTANCE OF FUNDING

Funding this project is an important step in accelerating biomedical research into ME/CFS and Long Covid. Both conditions urgently need reliable diagnostic tools, better understanding of underlying disease mechanisms, and clearer ways to distinguish between overlapping illnesses. This study directly addresses those gaps.

- **Helps move toward a diagnostic test** by identifying biological signatures that distinguish ME/CFS, Long Covid, and healthy controls.
- **Uses cutting-edge technology** capable of detecting proteins that standard tests miss, giving a clearer picture of immune and neurological changes.
- **Cost-effective technology** that allows use of small sample volumes to detect over 300 proteins without expensive preliminary steps or reagents.
- **Strengthens major research collaborations** between UCL, the UK ME/CFS Biobank, UCLH clinicians, and leading biomarker experts.
- **Provides essential pilot data** needed to secure larger grants, run validation studies, and develop future diagnostic panels or treatment targets.
- **Directly benefits people with ME/CFS and Long Covid** by supporting progress toward faster diagnosis, better understanding of the illness, and foundations for new treatments.