AI-ENABLED LOW-COST POINT-OF-CARE DIAGNOSTIC FOR EARLY DETECTION OF ALZHEIMER'S DISEASE

Introduction

We developed a multi-analyte detection for neurodegeneration. A functional prototype has been developed at TRL 2, featuring:

- A redox-active molecularly imprinted polymer (MIP) integrated onto low-cost, screen-printed gold electrodes.
- Successful detection of tau441 and pTau181 in spiked human plasma, with results validated against ELISA.
- Initial AI algorithms for signal classification, with promising accuracy in early tests.

Unmet Need:

Alzheimer's affects over 55 million people and may triple by 2050. Early diagnosis is vital, but current tools are invasive, costly (e.g., ~£200k Simoa), and rarely available in primary care—there's no scalable, NHS-ready PoC test. This project develops a portable, AI-enabled fingerprick blood test for plasma tau to enable early detection across settings

UoL Solution

- Generate a low-cost (£20), AI-enabled point-of-care (PoC) diagnostic platform for early detection of neurodegenerative disease using blood biomarkers, to replace centralised assays like Quanterix Simoa .
- Progress from TRL2 to 5 by outsourcing industrial design, regulatory consultancy (MHRA/QMS), health economics and functionalisation automation.
- Verify clinical utility by aligning the product with a target product profile (TPP), early engagement with manufacturing partners (UK, South Korea, China).

Intellectual property

Patent covering the device architecture and MIP formulation (GB180215.1 and GB139315.1).

Team

UoL's multi-disciplinary team; Dr. Sanjiv Sharma and his team brings extensive expertise in Alzheimer diagnosis. Supported by NIHR Liverpool, MRC, and industry partners in the UK and Japan, the team combines world-leading research with strong commercial networks.

Next Steps

Looking for co-development opportunities to conduct a large-scale pilot study and regulatory submission and quality management.

For further information contact:

Dr Zining Wang
zning.wang@liverpool.ac.uk
Senior Enterprise Manager
Enterprise Team