

Potential noninvasive test for Alzheimer's disease

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Professor Francis Martin, principal investigator of the study and Biosciences theme lead at UCLan. Credit: University of Central Lancashire

In the largest and most conclusive study of its kind, researchers have analysed blood samples to create a novel and non-invasive way of helping to diagnose Alzheimer's disease and distinguishing between different types of neurodegenerative disorders.

Following this breakthrough discovery, Alzheimer's sufferers may now have an additional test to improve the accuracy of [diagnosis](#) in order to better tailor appropriate treatment. The research also offers a valuable opportunity to monitor the [disease](#).

The study, published today in the prestigious journal *Proceedings of the National Academy of Sciences*, used sensor-based technology with a diamond core to analyse approximately 550 [blood samples](#). By passing light through the diamond and observing its interactions with the blood plasma, researchers were able to identify specific chemical bonds within the blood. This biochemical data was then used to assess whether the samples were normal or contained any trace of a neurodegenerative disease, and if so, which kind.

The groundbreaking scientific investigation was carried out by researchers at the University of Central Lancashire (UCLan), in collaboration with the University of Manchester, Lancaster University and the Federal University of Rio Grande do Norte, Brazil.

Alzheimer's diagnosis currently involves careful medical evaluation including a series of brain scans, physical examinations and memory testing, yet the only conclusive diagnosis is determined by post-mortem examination. This new blood test offers a non-invasive, more accurate and relatively cost-effective method of diagnosis, which will ensure the correct management of the condition.

Professor Francis Martin, principal investigator of the study and Biosciences theme lead at UCLan, said: "We have an aging population, meaning that the incidence and prevalence of Alzheimer's is increasing, as is the need for accurate diagnosis. The ability to identify different neurodegenerative diseases through the analysis of [blood](#) offers a faster and accurate way of establishing the most effective treatment plan as well as disease monitoring."

This new approach could also offer potential for carrying out tests to identify and monitor early signs of [mild cognitive impairment](#), meaning that the onset of Alzheimer's and other types of neurodegenerative diseases could be detected early and intervention measures could be put

in place earlier to slow the progress of these diseases. This could be particularly beneficial in the sporting world, to assess footballers, rugby players and boxers post-injury, as well as the general public.

Professor Martin added: "For those suffering with Alzheimer's disease, the damage is already well advanced once conventionally diagnosed, but this new method offers a potentially effective early screening tool when patients are only demonstrating signs of mild cognitive impairment. This is a potentially significant breakthrough for the prevention of different debilitating and chronic neurological diseases."

More information: Maria Paraskevaïdi et al. Differential diagnosis of Alzheimer's disease using spectrochemical analysis of blood, *Proceedings of the National Academy of Sciences* (2017). [DOI: 10.1073/pnas.1701517114](https://doi.org/10.1073/pnas.1701517114)

Provided by University of Central Lancashire

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