

Could Alzheimer's disease be diagnosed with a simple blood test?

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Spanish researchers, led by Pedro Carmona from the Instituto de Estructura de la Materia in Madrid, have uncovered a new promising way to diagnose Alzheimer's disease more accurately. Their technique, which is non-invasive, fast and low-cost, measures how much infrared radiation is either emitted or absorbed by white blood cells. Because of its high sensitivity, this method is able to distinguish between the different clinical stages of disease development thereby allowing reliable diagnosis of both mild and moderate stages of Alzheimer's. The work is published online in Springer's journal *Analytical & Bioanalytical Chemistry*.

Alzheimer's disease is the most common form of adult onset dementia and is characterized by the degeneration of the nervous system. In particular, as the disease progresses, the amount of amyloid- β peptide in the body rises. At present, the most reliable and sensitive diagnostic techniques are invasive, e.g. require analysis of cerebrospinal fluid (the liquid that surrounds the brain and spinal cord). However, [white blood cells](#) (or mononuclear leukocytes) are also thought to carry amyloid- β peptide in Alzheimer patients.

The researchers used two-dimensional infrared spectroscopy to measure and compare the [infrared radiation](#) emitted or absorbed by white blood cells of healthy controls, versus those of patients with mild, moderate and severe Alzheimer's disease. A total of 50 patients with Alzheimer's and 20 healthy controls took part in the study and gave blood samples.

The authors found significant differences in the range of infrared wavelengths displayed between subjects, which were attributable to the different stages of formation of amyloid- β structures in the [blood cells](#). The results showed that, with this method, healthy controls could be distinguished from mild and moderate sufferers of Alzheimer's disease. The method is being explored as a tool for early [diagnosis](#).

The authors conclude: "The method we used can potentially offer a more simple detection of alternative biomarkers of Alzheimer's disease. Mononuclear leukocytes seem to offer a stable medium to determine β -sheet structure levels as a function of disease development. Our measurements seem to be more sensitive for earlier stages of Alzheimer's disease, namely mild and moderate."

More information: Carmona P et al (2012). Infrared spectroscopic analysis of mononuclear leukocytes in peripheral blood from Alzheimer's disease patients. *Analytical and Bioanalytical Chemistry*; [DOI 10.1007/s00216-011-5669-9](https://doi.org/10.1007/s00216-011-5669-9)

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