

Seeing a diagnosis: How an eye test could aid Alzheimer's detection

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A simple and inexpensive eye test could aid detection and diagnosis of major neurological diseases such as Alzheimer's at an earlier stage than is currently possible, according to new research by UCL scientists.

The research, led by Professors Francesca Cordeiro & Stephen Moss and published today in *Cell Death & Disease*, demonstrates a new technique that enables retinal, and therefore brain cell death, to be directly measured in real time. The method, demonstrated in an animal model, could not only refine [diagnosis](#) of neurodegenerative disorders and help track disease progress; it could also aid the assessment and development of new treatments.

The technique uses fluorescent markers that attach themselves to the relevant cells and indicate the stage of cell death. The retina is then observed using a customised laser ophthalmoscope. Until now, this kind of technique has only been used in cells in the lab, rather than in live animals. This research is therefore the first ever in vivo demonstration of retinal nerve cell death in [Alzheimer's Disease](#).

Professor Cordeiro, UCL Institute of Ophthalmology, said: "The death of nerve cells is the key event in all neurodegenerative disorders - but until now it has not been possible to study cell death in real time. This technique means we should be able to directly observe retinal nerve cell death in patients, which has a number of advantages in terms of effective diagnosis. This could be critically important since identification of the early stages could lead to successful reversal of the disease progression

with treatment.

"Currently, the biggest obstacle to research into new treatments for neurodegenerative diseases is the lack of a technique where the brain's response to new treatments can be directly assessed - this technique could potentially help overcome that."

Although this paper outlines the technique in animal models (rats and mice), Professor Cordeiro's team are further along with work using the same technique to detect and assess glaucoma, and will be conducting their first patient trials later this year.

She added: "The equipment used for this research was customised to suit animal models but is essentially the same as is used in hospitals and clinics worldwide. It is also inexpensive and non-invasive, which makes us fairly confident that we can progress quickly to its use in patients.

"Few people realise that the retina is a direct, albeit thin, extension of the brain. It is entirely possible that in the future a visit to a high-street optician to check on your eyesight will also be a check on the state of your brain."

More information: The paper, 'Imaging multiple phases of neurodegeneration: a novel approach to assessing cell death in vivo', is published today in *Cell Death & Disease*.

Provided by University College London

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