

Scientists show that a key Parkinson's biomarker can be identified in the retina

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A study involving scientists from the University of Alicante and the United States notes that the accumulation of a protein known as alpha-synuclein in the retina is a key Parkinson's biomarker that could help detect the degree of severity of the disease.

The work has been published this month in *Movement Disorders*, a journal in the field of clinical neurology edited by the International Association of Parkinson's and Movement Disorders, and is part of a broader scientific project funded by the Michael J. Fox Foundation.

The main researcher of this project is Dr. Nicolás Cuenca at the University of Alicante at the University of Alicante. This worldwide study has been conducted with retinas from deceased Parkinson's patients donated to Sun Banner, a centre dedicated to the study of Parkinson's and Alzheimer's.

Cuenca and Ortuño Lizarán explain that they have studied in detail the alpha-synuclein protein as one of the main pathological marks that are usually analysed to determine Parkinson's [disease](#), a neurodegenerative disease that affects seven and ten million people in the world.

Parkinson's patients present an accumulation of alpha-synuclein in the [brain](#), a characteristic sign of this disease, which forms Lewy bodies, which proliferate as the disease progresses.

Cuenca and Ortuño Lizarán emphasise that the scientific relevance of their work is based on the fact that, for the first time, they have identified Lewy bodies in retinas of people with Parkinson's disease. This is the result of the study of the retinas sent by the Banner Sun Health Research Institute from deceased Parkinson's patients, whose clinical and pathological data of the brain are collected in this American institute.

Also, researchers have found a correlation—the greater the amount of alpha-synuclein in the retina, the more Parkinson's motor and clinical disturbances, and the more serious the condition.

The accumulation of this protein in the retina forming Lewy bodies is similar to that found in the brain in Parkinson's patients. "That is why we believe that alpha-synuclein is a helpful biomarker for Parkinson's; it can show the degree of severity of the disease and reflects, in some way, what is happening in the brain," Cuenca said.

Ortuño Lizarán stated that currently there is no technique applied in medicine to detect alpha-synuclein in the retina of a living person. The work reveals a second finding in that this protein not only appears in patients diagnosed with Parkinson's, but also in some who did not present the usual motor symptoms of tremors and slowness of movement, although their brains were already affected by this disease.

According to Ortuño, this indicates that [alpha-synuclein](#) can also be an early biomarker, which could help detect Parkinson's before the clinical symptoms appear.

One aspect of this research work, which is not included in the study, is the death of dopaminergic cells found both in retina and brain.

Parkinson's disease is characterised by the degeneration of dopaminergic neurons, which release dopamine, a key neurotransmitter for motor function, and people who suffer from this disease often experience visual disturbances.

Both researchers emphasise that the [retina](#) represents the ideal place to study Parkinson's, Alzheimer's and multiple sclerosis as it is an extension of the brain and part of the central nervous system.

More information: Isabel Ortuño-Lizarán et al. Phosphorylated α -synuclein in the retina is a biomarker of Parkinson's disease pathology severity, *Movement Disorders* (2018). DOI: [10.1002/mds.27392](https://doi.org/10.1002/mds.27392)

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