

## **Smoking can protect against Parkinson's? Only with the right gene! American Academy of Neurology selects study by Mayo Clinic, Rochester (USA) and European Academy of Bozen/Bolzano**

Smoking causes cancer, but it could protect against Parkinson's disease. This has been demonstrated by various epidemiological studies, according to which there exists an inverse relationship between smoking and the probability of developing Parkinson's disease.

The link is not however 100% clear, as some smokers develop the illness nevertheless. The hypothesis is that there is a genetic predisposition that, in combination with environmental factors, can trigger the disease. Taking this as its starting point, a team from the Mayo Clinic in Rochester, MN (USA) has carried out a study on a sample of 1228 subjects. The team includes Maurizio Facheris, a researcher at the Institute of Genetic Medicine at the European Academy of Bozen/Bolzano (EURAC), previous Research Fellow at the prestigious American clinic and who co-ordinated the study.

The researchers hypothesized that the variation may be due to pharmacogenetic effects and that nicotine might have neuroprotective properties for certain individuals.

"We asked the interviewees to tell us about their relationship with smoking and then compared this data with the presence or absence of variations in the gene *CYP2A6*, which encodes the enzyme responsible for metabolising nicotine", says EURAC researcher Maurizio Facheris, neurologist at the Department of Neurology of Bozen/Bolzano Central Hospital and main author of the study.

From an analysis of the data, it emerges that the presence of a particular variant of the gene, when combined with smoking, considerably reduces the risk of contracting Parkinson's disease. It remains to be clarified whether the protection against the disease is provided by the particular variant of gene *CYP2A6* or by the presence of cotinine, the substance into which nicotine is transformed through the action of the gene. "If this second hypothesis is confirmed, producing a cotinine-based drug would be a means to reduce exposure to the disease", explains Maurizio Facheris.

The study opens up interesting scenarios in the field of pharmacogenetics, a discipline that holds that variations in different patients' response to pharmacological treatment depends on genetic factors. Under this view, analysing the patients' DNA will allow us to predict their reaction to a particular drug and thus enable the development of personalised medicines.

The study was presented at Toronto on the occasion of the annual convention of the American Academy of Neurology, and was selected as among the top 5% of over 2,000 articles received. It was the first study of its kind to be presented.

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