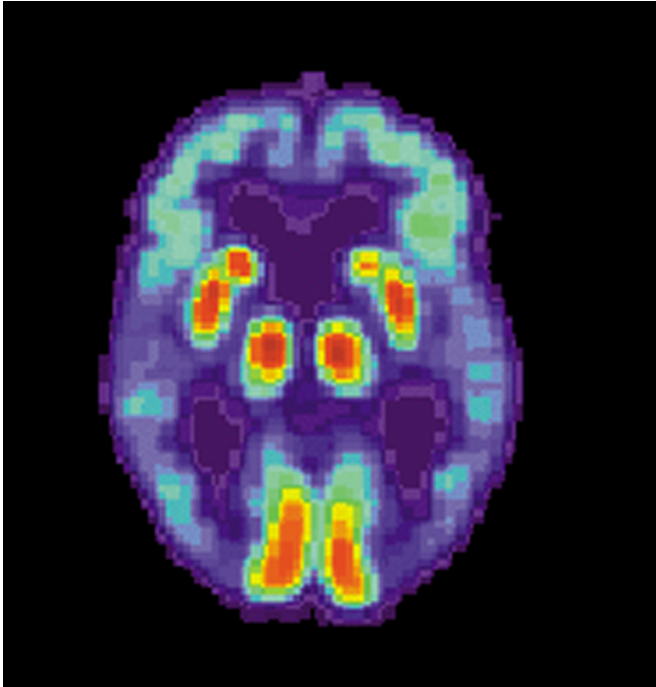


Big data reveals new Alzheimer's risk genes

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PET scan of a human brain with Alzheimer's disease.
Credit: public domain

An international research team led by scientists at the University of Edinburgh and the University of Queensland, has identified three new genes linked to the risk of Alzheimer's disease. The study, supported by Alzheimer's Research UK and also involving researchers from the Icahn School of Medicine at Mount Sinai, is published today (18 May) in the journal *Translational Psychiatry*.

The researchers combined findings from an existing study of Alzheimer's genetics, with those from a new analysis involving the children of people with the [disease](#). The findings are set to help researchers better understand the mechanisms underlying Alzheimer's and could open the door to new approaches for treating the disease.

To find genetic risk factors for diseases like

Alzheimer's, researchers generally compare the DNA code of people with and without the disease. By carefully analysing data from very large groups of people, researchers can pick out gene variations that are more common in people who have Alzheimer's. This approach has helped to find around 30 genes that are associated with Alzheimer's risk.

The more people who are involved in these genetic studies, the more powerful they are and the more they can reveal about the genetics of Alzheimer's. Large-scale research resources like the UK Biobank hold rich genetic and medical information about hundreds of thousands of research volunteers, but as only a fraction of this data comes from people with Alzheimer's, relatively few people can be included in the genetic studies.

In this new study, Alzheimer's researchers used a technique that allowed them to cast their nets more widely and include many more people in their genetic analysis. The research involved genetic information from over 300,000 people from the UK Biobank. As most of the participants were too young to be diagnosed with Alzheimer's, the research team looked to medical information about their parents, many of whom had developed the disease.

On average, children share 50% of their genes with each of their parents. While at the individual level having a parent with Alzheimer's doesn't mean you are at a much greater risk of the disease, by combining data from many thousands of people whose parents developed Alzheimer's the researchers were able to sift out genetic information relevant to the disease.

The team combined results from their new analysis with data from an existing genetic study involving 70,000 people with and without Alzheimer's disease. The findings highlight three new genes that may play a role in Alzheimer's risk.

Prof Peter Visscher, from the University of

Queensland, said:

"By focusing on people with a family history of Alzheimer's, we have been able to take advantage of a wealth of existing data to gain new insights into the genetics of the disease. One challenge of this method is that we rely on people to provide accurate information about whether their parents developed Alzheimer's, and in some cases the disease can be mistaken for another form of dementia or go undiagnosed."

Dr. Riccardo Marioni, from the University of Edinburgh, said:

"New genetic discoveries can provide vital clues to the biological processes involved in Alzheimer's, but our genetic makeup is not the only factor that affects our risk of the disease. We are now working to combine genetic data and information about people's lifestyle to produce more comprehensive and personalised picture of Alzheimer's risk. Understanding how genetic and lifestyle factors interact to affect our overall risk could lead to more targeted risk reduction strategies and pave the way to precision medicine in Alzheimer's disease."

Dr. Sara Imarisio, Head of Research at Alzheimer's Research UK, said:

"This innovative research highlights three new genes linked to the risk of Alzheimer's disease and presents promising leads for future research. The next step will be for molecular scientists to assess how these genes might contribute to the development of Alzheimer's and fit in to the existing picture of the disease. Interestingly, two of these [genes](#) are targeted by drugs that are used to treat other conditions, signalling a potential direction for research into new Alzheimer's treatments.

"Dr. Marioni is unlocking the power of big data by applying cutting-edge statistical techniques to rich medical, genetic and lifestyle information provided by hundreds of thousands of research volunteers.

People don't have to have dementia to take part in research studies, and anyone who is interested in playing a part can find out how at <http://www.joindementiaresearch.org>

"There are currently no treatments to slow or stop the progression of Alzheimer's, but research can change this picture. Alzheimer's Research UK is proud to be supporting this pioneering research, none of which would be possible without the efforts of our dedicated supporters."

Provided by University of Edinburgh

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