



THE UNIVERSITY *of* EDINBURGH

## *News Release*

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### **Gene study helps explain why some of us stay sharp as we age**

Scientists have discovered a link between our genes and quick thinking skills in middle and later life.

Researchers identified common genetic variants – changes in a person’s genetic code – that are related to how quickly a person is able to process new information. It is the first time that scientists have found such a link.

The researchers say the finding could help understand how the brain works, and why some people develop mental decline, while others do not.

The Cohorts for Heart and Aging Research in Genomic Epidemiology (CHARGE) Consortium, which includes experts at the University of Edinburgh, brought together data from 12 different countries.

Data from 30,000 people, aged more than 45 years old were analysed.

The participants – none of whom had dementia – took cognitive function tests that included tests of simple, repeated coding under pressure of time.

Researchers then processed the results alongside details of each person’s genome to identify genetic variants or changes associated with speed of thinking skills.

People with slower processing speed overall were found to have variants near a gene called *CADM2* – also known as *Syncam2*.

The *CADM2* gene is linked to the communication process between brain cells, evidence of the gene’s activity is abundant in the frontal and cingulate cortex in the brain – areas of the brain involved thinking speed.

Lead researcher Dr. Carla Ibrahim-Verbaas, resident in Neurology at Erasmus University Medical Center in Rotterdam, The Netherlands, said: “We have identified a genetic variant which partly explains the differences in information processing speed between people. Our study confirms the likely role of *CADM2* in between-cell communication, and therefore cognitive performance. It is of interest that the gene has also been linked to autism and personality traits.”

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The study complements two other recent discoveries by the CHARGE team, which identified genetic variants associated with memory performance and general cognitive functioning in older adults.

Professor Ian Deary, Director of the Centre for Cognitive Ageing and Cognitive Epidemiology at the University of Edinburgh and a co-author on the study, said: "Processing speed is thought to be a core capability for preserving other mental skills in older age. That's why my team at Edinburgh have focussed on it for the last 30 years.

"This inkling into why some people's processing speed is more efficient than others is a small but encouraging advance in understanding the biological foundations of more efficient thinking."

The study, published in *Molecular Psychiatry*, involved researchers in Australia, Austria, Croatia, Finland, France, Germany, Holland, Iceland, Ireland, Italy, the UK and the US.

It also included data from five studies based at the University of Edinburgh including The Lothian Birth Cohort 1921, the Lothian Birth Cohort 1936, the Orkney Complex Disease Study (ORCADES), and the Croatia-Korčula and Croatia-Split cohorts. The Lothian Birth Cohort 1921 and the Lothian Birth Cohort 1936 are part of a larger project called the Disconnected Mind, which is supported by Age UK.

It is also supported by the Medical Research Council (MRC) and the Biotechnology and Biological Sciences Research Council (BBSRC).

The Orkney Complex Disease Study (ORCADES) is a genetic study based in the Orkney isles and is funded by the Chief Scientist Office of the Scottish Government, the Royal Society, the MRC Human Genetics Unit, Arthritis Research UK and the European Union framework program 6.

The Croatia-Korčula and Croatia-Split cohorts, a genetic study by of The University of Split and The University of Edinburgh is supported by grants from the MRC, the Ministry of Science, Education, and Sport of the Republic of Croatia, the European Union.

The Generation Scotland study is supported by the Chief Scientist Office of the Scottish Government Health Directorates, the Scottish Funding Council, and the MRC.

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