Large study explores combined influence of genetics and lifestyle in the development of Alzheimer's disease

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A global study involving more than one million people worldwide will explore the relationship between genetics and lifestyle in the development of Alzheimer's disease.

Led by scientists from Cardiff University, the £6M project will combine the power of multiple epidemiological studies from around the world to produce the most comprehensive understanding of the disease's risk to date.

Information gleaned from these studies about genetic predisposition and lifestyle influences will provide scientists with the best evidence yet for creating a fuller picture of why the disease develops and the varying degrees of risk it poses to different individuals.

"For too long scientists studying Alzheimer's have been working in silos, engaged in a single-minded 'race' to try and beat the disease. That's simply not going to happen unless we pull together," said Principal Investigator Professor Julie Williams, Head of Neurodegeneration at Cardiff University School of Medicine's Medical Research Council (MRC) Centre on Neuropsychiatric Genetics and Genomics.

"The aim of our study is to harmonise the research of scientists studying the genetic risk of Alzheimer's with the work of those studying the lifestyle influences, with the ultimate goal to creating more personalised

treatments for the disease - and, better yet, treatments that offset it altogether. Put simply, this is a study large enough to get answers.

"The insights gleaned will pave the way for a new era of therapies for the disease. We predict that in future, based on this unrivalled data, GPs may be able run a simple test to analyse a patient's risk of developing Alzheimer's. A combination of gene therapy, drugs and lifestyle changes could then be prescribed to reduce that risk," she added.

Based on the genetic data of more than a million people aged 65+ - and some younger - from Europe, US, Australia and Asia, researchers will be able to paint a picture of the genetic architecture underpinning Alzheimer's. The size of the study is significant, as a larger sample of data allows for more accuracy and a stronger basis for analysis. New biomarker data gleaned from the study will help scientists understand what triggers the disease, enabling them to identify new genetic and lifestyle risk factors, as well as the factors that mitigate risk, leading to a better management of the condition for future generations.

Susceptibility to Alzheimer's will be encoded using a polygenic risk score which will take into account an individual's genetic makeup, combined with information about their lifestyle and diet. This new information will improve scientific understanding of the pre-symptomatic phase of the disease opening up the possibility for early clinical trials on those who are asymptomatic, and search for a way not to merely treat the disease but to prevent its manifestation.

Researchers will also be able to distinguish those at a 'high-risk' status from those of a lower risk and will in the long-term provide an opportunity for early intervention, saving the brain before it reaches a state of irreversible damage. Previous studies conducted by Cardiff University have uncovered a total of 21 susceptibility genes linked to Alzheimer's. The findings revealed significant evidence that shows

clusters of genes implicating potential biological pathways in the disease, including cholesterol transport and the immune system.

Dr Eric Karran, Director of Research at Alzheimer's Research UK, said:

"We are proud to be supporting this important research, which will bring together researchers from different disciplines across the globe. This type of collaboration is crucial for driving research forward: it's important to combine insights from different strands of research in order to gain a more complete understanding of Alzheimer's.

"Our risk of developing Alzheimer's is likely to be down to a complex mix of genetic and environmental factors, and the better we understand these factors the greater our chance of finding ways to intervene. With half a million people in the UK currently living with Alzheimer's, we urgently need to find treatments that can make a difference."

Provided by Cardiff University

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