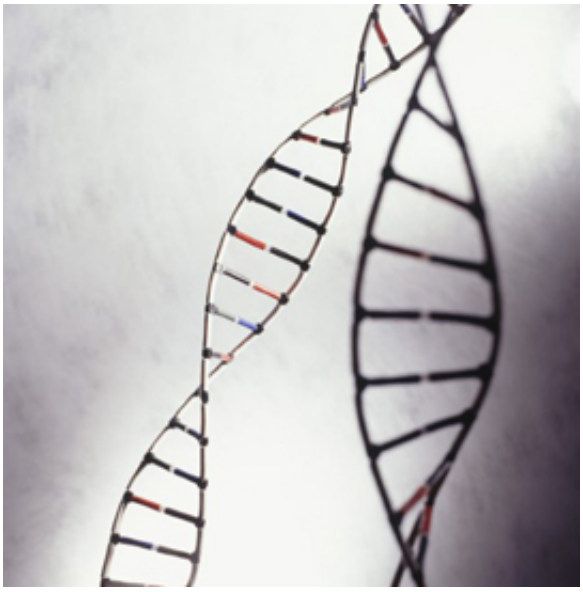
Researchers identify genetic associations of neuroticism

April 12 2016



Credit: NIH

Neuroticism, a personality trait related to depression, anxiety and even heart disease, can be linked to nine new distinct gene-associations according to international research led by the University of Glasgow.

The study, which is published today in *Molecular Psychiatry*, was co-led by Professor Daniel Smith from the Institute of Health and Wellbeing and included researchers from the Universities of Edinburgh, Cardiff and Queensland, Australia.

The existence of these genetic associations could indicate a person's predisposition to the personality trait neuroticism.

The authors focused on neuroticism as it is the personality trait most closely associated with mental illness and physical health problems.

People who have high neuroticism levels tend toward depression and anxiety. They also tend to have worse physical health, with links to conditions such as obesity and heart disease.

The research represents the largest genetic study of a personality trait ever undertaken, and improves our understanding of people's personality differences, and why some are more predisposed to mental health problems than others.

The study tested more than 100,000 individuals from the UK Biobank cohort, the Generation Scotland sample and the Queensland Institute of Medical Research sample.

Professor Smith said: "As a psychiatrist, this is an exciting discovery because we have identified for the first time genetic risk factors for a personality trait which is of fundamental importance for psychological wellbeing.

"This work could open new avenues for future research and for the identification of new treatment approaches for depression and anxiety. It is a first step to understanding the biology and genetic basis of a person's vulnerability to depression and anxiety."

Although further work is needed to pinpoint the exact DNA changes responsible, the findings potentially indicate the involvement of molecules linking neuroticism with mental illness.

One has an important role in managing the body's response to stress, while another influences the function of glutamate – an important brain chemical involved in a range of psychiatric disorders, including schizophrenia, depression and suicide.

Professor Ian Deary, from the University of Edinburgh, said, "I have been researching on human personality for almost 30 years. These new results are, at last, a start for our understanding the biological mechanisms that predispose some people to generally feel more anxious and low in mood than others."

Professor Michael O'Donovan, from Cardiff University said "this research confirms at a molecular level what epidemiological research has clearly shown to those who are not blinded by prejudice; to understand the origins of psychological traits, the most human of all our characteristics, we have to understand both our genetic inheritance and our environment."

Dr Raliza Stoyanova, Neuroscience & Mental Health Senior Portfolio Developer at the Wellcome Trust, said: "By combining a number of very large studies, including UK Biobank, the researchers have identified new genetic associations for neuroticism—one of the five fundamental personality traits present in all of us.

"It will be important for future work to uncover how these genetic links affect brain function, and to pin down whether they increase someone's chance of developing clinical depression."

The study is published today in the journal *Molecular Psychiatry*.

More information: D J Smith et al. Genome-wide analysis of over 106 000 individuals identifies 9 neuroticism-associated loci, *Molecular Psychiatry* (2016). DOI: 10.1038/mp.2016.49

Provided by University of Glasgow