

Schizophrenia linked to signaling problems in new brain study

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Schizophrenia could be caused by faulty signalling in the brain.

(PhysOrg.com) -- Schizophrenia could be caused by faulty signalling in the brain, according to new research published today in the journal *Molecular Psychiatry*. In the biggest study of its kind, scientists looking in detail at brain samples donated by people with the condition have identified 49 genes that work differently in the brains of schizophrenia patients compared to controls.

Many of these genes are involved in controlling cell-to-cell signalling in the brain. The study, which was carried out by researchers at Imperial

College London and GlaxoSmithKline, supports the theory that abnormalities in the way in which cells 'talk' to each other are involved in the disease.

Schizophrenia is thought to affect around one in 100 people. Symptoms vary but can include hallucinations, lack of motivation and impaired social functioning. The disorder has little physical effect on the brain and its causes are largely unknown.

Some scientists believe that schizophrenia could be caused by the brain producing too much dopamine, partly because drugs that block dopamine action provide an effective treatment for the condition. Another theory is that the coat surrounding nerve cells, which is made of myelin, is damaged in people with schizophrenia. However, the new study found that the genes for dopamine and for myelin were not acting any differently in schizophrenia patients compared with controls.

Professor Jackie de Belleruche, the corresponding author of the paper from Imperial College London said: "The first step towards better treatments for schizophrenia is to really understand what is going on, to find out what genes are involved and what they are doing. Our new study has narrowed the search for potential targets for treatment."

As well as pointing towards signalling as the cause of schizophrenia, the new findings could also lead to new ways of diagnosing the condition. At the moment, patients are diagnosed on the basis of their behaviour.

"Most patients are diagnosed as teenagers or in their early 20s, but if they could be diagnosed earlier, they could be treated more effectively and they could have a better quality of life. To have the possibility of transforming someone's life early on instead of having to take drugs indefinitely would be wonderful," added Professor de Belleruche.

The researchers reached their conclusions after analysing brain tissue from 23 controls and 28 schizophrenia patients, selected from brains donated by UK patients being treated for schizophrenia and comparing the data to an equivalent study in the USA. The changes described in this study were common to both studies. This is the biggest cohort of schizophrenia patients used for this type of study to date.

This is part of a larger study looking at proteins and DNA as well as mRNA in the samples, which were taken from two brain regions associated with schizophrenia: the frontal cortical area and the temporal cortex. mRNA are copies of small sections of our DNA that cells use to build proteins. Unlike DNA, mRNA varies in different parts of the body, where different proteins are needed.

More information: "Analysis of gene expression in two large schizophrenia cohorts identifies multiple changes associated with nerve terminal function" *Molecular Psychiatry*, 3 March 2009 Corresponding author: Professor J de Belleruche.

Source: Imperial College London

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