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New schizophrenia genes uncovered

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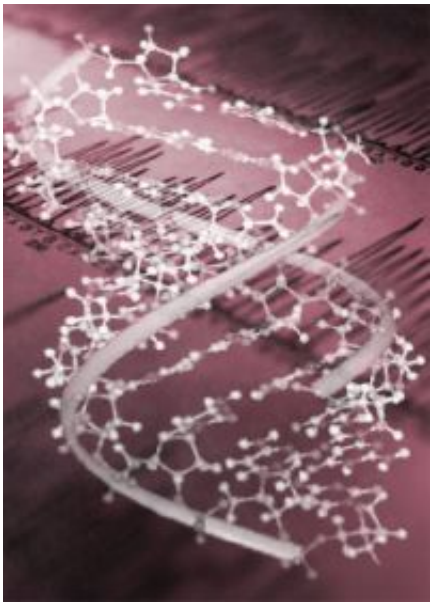

(PhysOrg.com) -- Researchers have discovered new genes linked to schizophrenia, it has been revealed. In two papers published in *Nature* today (July 30), scientists identify four mutated gene regions that may hold the key to producing new tailor-made drugs to treat the devastating mental illness.

It is hoped the finds, which are likely to galvanize the field of psychiatric genetics, could also lead to earlier diagnosis of the disorder, which affects around one in every 100 people.

The papers report the findings from two large international schizophrenia consortia, including pioneering Scottish researchers from the University of Aberdeen and the University of Edinburgh.

"Lots more work needs to be done, but what these discoveries will do is help us start to classify the sub-types of the illness so that individualised, targeted medicine is possible in the future," said Professor St Clair, Chair in Mental Health at the University of Aberdeen, and an author on both papers.

"At the moment a broad range of anti-psychotic drugs are used to treat schizophrenia, but because people respond to drugs in different ways, treatments are largely trial and error and often involve unpleasant side effects."

He added that the findings could also make it possible to identify those at risk of mental illness before it arises, or place them accurately on the spectrum of mental disorders when symptoms do appear.

Professor St Clair and University of Edinburgh researchers Professor Douglas Blackwood and Dr Walter Muir headed up the Scottish arm of the studies.

Douglas Blackwood, Professor of Psychiatric Genetics at the University of Edinburgh said: "It is well recognized that schizophrenia has a variety of causes and several different factors can trigger episodes. But mutations, deletions and other variation in genes are probably the largest contributors.

"These are exciting new findings because the chromosomal abnormalities that have been described will be signposts to other genes involved in illness and hopefully lead on to new drug discoveries and novel treatment approaches. This is good news for all the patients and

their families throughout Scotland who have given tremendous support to these genetic studies over several years".

The Scottish scientists were previously instrumental in the discovery of the first schizophrenia gene, DISC1, which was eventually cloned in 2000. Several other genes linked to the illness and other psychological disorders have since been identified in individual patients. However, the findings were accused of being statistically weak.

The two new studies are the first to carry out large-scale surveys of schizophrenia patients. Each saw the genes of around 3,000 to 5,000 patients from all over the world, and an equal number of controls, scanned for variations in their DNA sequence.

Four micro-deletions, or mutations – 15q13, 1q21 and 15q11 as well as 22q11 – were found to occur significantly more often in those with schizophrenia.

"The field of schizophrenia genetics has been quite controversial for the last 20 years and some people would argue that no genes have really been found," said Professor St Clair. "But that era has now effectively drawn to a close because it is very difficult to dispute these new findings. These discoveries consolidate the field and make psychiatric genetics, after many false starts, one of the most exciting areas in the biological sciences."

The researchers' findings included evidence that:

-- Mutations are occurring at a far higher rate than thought possible – around one in every 10,000 people rather than one in every 10 million. This goes some way to explaining why psychological disorders such as schizophrenia can appear 'out of the blue' in some families.

-- The mutations were found to be present in some individuals with schizophrenia as well as those with autism and a range of other psychological disorders, suggesting that the two conditions are not as separate as previously thought.

-- The mutations leave the human population as quickly as they appear, i.e. they are selected against. This is thought to be partly because individuals with autism and schizophrenia have few children but may also be due to siblings of the mentally ill also failing to reproduce.

Professor St Clair added: "Much more work will need to be done before these discoveries impact on clinical practice, diagnosis and treatment – but the field is moving very rapidly. Moreover, the UK and especially Scotland is well placed to continue to play a leading role in continuing to reveal the complex genetics behind psychiatric disorders."

The *Nature* papers are:

1. 'Large recurrent micro-deletions associated with schizophrenia', Nature, Digitial Object identifier (DOI) number – 10.1038/nature07229;

2. 'Rare chromosomal deletions and duplications increase risk of schizophrenia', Nature, DOI number – 10.1038/nature07239.

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