Medical Xpress

Scientists discover genetic changes that may contribute to the onset of schizophrenia

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Scientists from the Centre for Addiction and Mental Health (CAMH) have discovered rare genetic changes that may be responsible for the onset of schizophrenia. Several of these same genetic lesions had previously been found to have causal links to autism spectrum disorder (ASD). This discovery gives new support to the notion that multiple rare genetic changes may contribute to schizophrenia and other brain disorders.

This discovery also suggests that clinical DNA (genome-wide microarray) testing may be useful in demystifying one of the most complex and stigmatized human diseases. The study is published in the current issue of *Human Molecular Genetics*, and was funded by the Canadian Institutes of Health Research (CIHR).

In the first study of its kind, scientists at CAMH and The Centre for Applied Genomics (TCAG) at The Hospital for Sick Children analyzed the DNA of 459 Canadian adults with schizophrenia to detect rare genetic changes of potential clinical significance.

"We found a significant number of large rare changes in the chromosome structure that we then reported back to the patients and their families," said Dr. Anne Bassett, Director of CAMH's Clinical Genetics Research Program and Canada Research Chair in Schizophrenia Genetics and Genomic Disorders at the University of Toronto. "In total, we expect that up to eight per cent of schizophrenia may be caused in part by such genetic changes—this translates to

roughly one in every 13 people with the illness." These include several new discoveries for schizophrenia, including lesions on chromosome 2.

The research team also developed a systematic approach to the discovery and analysis of new, smaller rare genetic changes leading to schizophrenia, which provides dozens of new leads for scientists studying the illness. "We were able to identify smaller changes in chromosome structure that may play an important role in schizophrenia—and that these often involve more than one gene in a single person with the illness," added Dr. Bassett, who is also a Clinician Scientist in the Campbell Family Mental Health Research Institute.

"Moving forward, we will be able to study common pathways affected by these different genetic changes and examine how they affect brain development – the more we know about where the illness comes from, the more possibilities there will be for the development of new treatments."

"CIHR is pleased to support researchers whose work aims at demystifying the causes of schizophrenia," said Dr. Anthony Phillips, Scientific Director of the CIHR Institute of Neurosciences, Mental Health and Addiction. "We hope Canadians who live with schizophrenia will eventually benefit from these important findings."

Several of the genes and pathways discovered in this study of schizophrenia have also been identified to be important in causing ASD. This includes the large rare changes in chromosome structure of potential clinical significance. "We have seen the success clinical microarray testing has had in making sense of ASD for families, and we think the same could be true for schizophrenia," added Dr. Stephen Scherer, Director of TCAG and the University of Toronto's McLaughlin Centre.