

Rare mutation dramatically increasing schizophrenia risk

25 October 2009

An international team of researchers led by geneticist Jonathan Sebat, Ph.D., of Cold Spring Harbor Laboratory (CSHL), has identified a mutation on human chromosome 16 that substantially increases risk for schizophrenia.

The mutation in question is what scientists call a copy number variant (CNV). CNVs are areas of the [genome](#) where the number of copies of genes differs between individuals. The CNV is located in a region referred to by scientists as 16p11.2. By studying the genomes of 4,551 patients and 6,391 healthy individuals, Sebat's team has shown that having one extra copy of this region is associated with schizophrenia. The study appears online today ahead of print in the journal [Nature Genetics](#).

The mutation identified in this study is a potent risk factor. "In the general population this duplication is quite rare, occurring in roughly one in 5,000 persons", says Sebat, "but for people that carry the extra copy, the risk of developing schizophrenia is increased by more than eight-fold". This finding is the latest in a series of studies that have pinpointed rare CNVs that confer substantial risk of schizophrenia. Others include deletions on [chromosomes](#) 1, 15 and 22.

Schizophrenia and autism: two sides of the same coin?

"This is not the first time that the 16p11.2 region has caught our eye," says Sebat. It was previously spotted in a 2007 study with Professor Michael Wigler at CSHL -- a deletion of the identical region was identified in a girl with [autism](#). Studies by several other groups have shown that losing one copy of 16p11.2 confers high risk of autism and other developmental disorders in children.

Taken together these studies suggest that some genes are shared between schizophrenia and autism, according to Sebat and colleagues. "In

some ways, we might consider the two disorders to be at opposite ends of the same neurobiological process" says Shane McCarthy, Ph.D., the lead author of the study, "and this process is influenced by the copy number of genes on chromosome 16." One hypothesis is that the loss of 16p11.2 leads to the deprivation of key genes involved in brain development, while an extra copy of this region might have the opposite effect.

A correlation between 16p11.2 mutations and head size

It is not known what biological processes are affected by the copy number of 16p11.2, Sebat notes. He believes, however, that the team may have stumbled on to an important clue. By studying the clinical records of patients, they discovered that patients with deletions of the region differ significantly in head size from those with duplications of the same region. Sebat reports, "Head circumference of patients with the deletion were larger than average by more than one standard deviation. Head circumference was slightly below average in patients with the duplication." These findings, he notes, are consistent with some previous studies that have observed a trend towards larger brain size in autism and an opposite trend toward smaller brain size in schizophrenia.

More information: "Microduplications of 16p11.2 are associated with [schizophrenia](#)" will be published online ahead of print in *Nature Genetics* on October 25.

www.nature.com/ng/journal/vaop/ncurrent/index.html . The article will appear in the journal's print issue for November 2009 (Vol. 41, No., 11).

Source: Cold Spring Harbor Laboratory ([news](#) : [web](#))

APA citation: Rare mutation dramatically increasing schizophrenia risk (2009, October 25) retrieved 5 May 2021 from <https://medicalxpress.com/news/2009-10-rare-mutation-schizophrenia.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.