

Schizophrenia consists of eight different genetic diseases

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The researchers at the University of Granada who have participated in this project. From left to right, Rocío Romero Zaliz, Javier Arnedo, Igor Zwir y Coral del Val.

Scientists from the universities of Granada (Spain) and Washington in St Louis (US) have found that there is not a single type of schizophrenia, but that it consists of a group made up of eight genetically different types of diseases, each of which presents its own set of symptoms.

This important find, published recently by the prestigious *American Journal of Psychiatry*, could be an important first step towards a better diagnosis and treatment of this [disease](#), which affects approximately 1% of world population.

It was known so far that approximately 80% of the risk of suffering from schizophrenia was hereditary, although [scientists](#) have struggled for years to identify which specific genes lead to it.

This new research, in which 4196 patients diagnosed with schizophrenia participated, has for the first time identified the different genes networks that contribute to the existence of eight different types of schizophrenia. In this research other 3200 healthy patients participated as control group.

Genes function as an orchestra

"Genes do not operate on their own, in an isolated manner," Igor Zwir, a researcher at the university of Granada and co-author of his article, pointed out, "they rather work with each other as an orchestra. To understand how they work, we must not just know what each member of this orchestra is like, but also how they interact with each other."

"What we did with this research, after a decade of frustration in the field of psychiatric genetics, is identify the manner in which the genes interact with each other, in an orchestrated manner in the case of healthy patients, or disorganized, as happens in the cases that lead to the different types of schizophrenia," claim the authors of the publication.

Thus, in some patients with hallucinations or delirium, for instance, researchers agree that there are different networks of genes related to their respective symptoms, which demonstrates that specific genetic variations interact with each other. This genetic analysis leads to 95% certainty in predicting the onset of schizophrenia. In another group, they found that incongruent speech and disorganized behaviour are specifically associated with a DNA variations network that leads to a 100% risk of suffering schizophrenia.

Researchers divided the patients according to the type and seriousness of positive symptoms (such as different types of hallucinations or deliriums), or negative symptoms (such as lack of initiative, troubles in organizing thoughts, or lack of connection between emotion and thought). In parallel, scientists classified the profiles of these symptoms into eight qualitative types of different diseases according to the underlying genetic conditions.

Individual genes

"In the past, scientists had searched for associations between individual genes and schizophrenia—researchers point out. What was lacking was the idea that these genes do not act independently, but that they work as a group instead, to disturb the structure and the functions of the brain, thus causing the disease."

Although individual genes only present weak, inconsistent associations with schizophrenia, the interaction networks of gene groups pose a high risk of suffering from the disease, between 70 and 100%, "which makes it almost impossible that individuals with those genetic variation networks will avoid schizophrenia."

Researchers found a total of 42 genes groups that influenced in a variety of ways the risk of suffering schizophrenia. They also replicated their

finds in two independent samples of individuals with schizophrenia, an index that these networks are a valid path for the exploration and improvement of the diagnosis and treatment of this disease.

Profesor Zwir points out that, by identifying these [genes](#) networks and their adjustment within the symptoms in individual patients, 'it will soon be possible to determine a possible localized treatment for the specific paths that cause [schizophrenia](#)" and he emphasizes the fact that this work, published in the *American Journal of Psychiatry*, "has been performed and designed by researchers in the field of Computational Science."

More information: Arnedo J, et al. Uncovering the hidden risk architecture of the schizophrenias: confirmation in three independent genome-wide association studies. *The American Journal of Psychiatry*.vol.172 (2), 2014. www.ncbi.nlm.nih.gov/pubmed/25219520

Provided by University of Granada

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