

## Emerging Science

No two brains, or minds, are exactly the same. The sheer scale of this variety is staggering, when you take into account our global population.

Schizophrenia is an illness that affects approximately one person in a hundred worldwide, or seventy million out of a population of seven billion.

To put it another way, that's about 17.5 times the population of New Zealand.

By looking at the statistics for schizophrenia alone, we get some insight into the number of people facing the challenge of mental illness today. Fortunately, Tangata Whaiora are not the only ones rising up to this challenge.

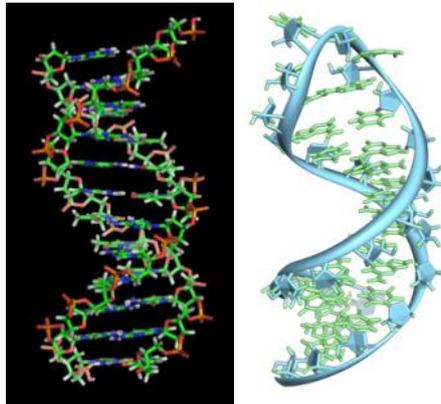
Science is an powerful ally of those living with any illness—physical or mental. Each year sees new advances, which make possible things that would have been considered impossible even a few decades ago.

The field of genetics is one such advance. Scientists are able to shift their focus from the mind itself, of which no two are the same, to the microscopic world of DNA. Looking at this pattern of genetic code, it is becoming easier to see the similarities between people.

Genetics are thought to play some part in the onset of schizophrenia, but this link hasn't yet been traced to a single gene. Several genes are thought to be relevant, and even then only to a sub-population of patients. Even

having these genes isn't a guarantee of experiencing the illness.

DNA is only a part of the puzzle. All known forms of life contain three essential molecular building blocks: DNA, proteins, and RNA.



DNA (left) and RNA (right):

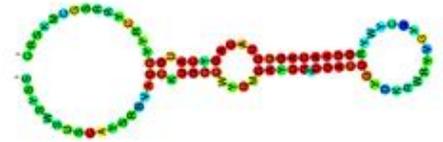
Unlike DNA (deoxyribonucleic acid,) RNA (ribonucleic acid) structures are usually made of single strands like the example above. They come in a range of sizes, and can adopt complex three dimensional structures.

If DNA could be likened to the blueprints of our body, one of the functions of RNA is to act as a "foreman" to make sure these plans are followed properly. This is the job of microRNA.

There are approximately one thousand microRNAs in the human body, and more can be found in the brain than in any other tissue.

According to a study published in the online journal *Proceedings of the National Academy of Science USA* on the 6th of February this year, altered brain tissue levels of one of these microRNAs in particular—miR-132—could play a role in the development of schizophrenia.

Scientists measured the levels of 850 mircoRNAs in the brains of 100 people with schizophrenia, and discovered that miR-132 was the only microRNA whose levels were considerably disrupted compared to the control group.



Mir-132

It was also discovered that mirR-132 plays a part in the brain's development during adolescence and early adulthood, and it controls over ten percent of genes which are abnormal in the brains of people with experience of schizophrenia.

According to Claes Wahlestedt, a member of the team of researchers who conducted the study, this discovery could have great benefits for mental health:

*"Schizophrenia has been difficult to treat precisely because many different genes and brain systems are affected. The identification of a key regulatory molecule like miR-132 will allow us to better understand what goes biologically wrong in schizophrenia, and design medications that address the specific problem, without causing side effects associated with current treatments that can be so severe that many patients stop using them."*

Tony Spencer

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"Korero Mai" is edited by Gordon Hudson, "What's On" by Stephanie Mapley and "Whakaaro Pai" by Tony Spencer—all from Like Minds Taranaki. Your news and views are eagerly sought. Like Minds Taranaki, P O Box 5015, New Plymouth, 3rd Floor, Stirling Sports Building, Devon Street West, NP, ph 06-759-0966 [mental.health@xtra.co.nz](mailto:mental.health@xtra.co.nz). [www.likemindstaranaki.org.nz](http://www.likemindstaranaki.org.nz)

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