



## Identical twins not actually identical, shocking Canadian research finds

BY MARK IYPE, POSTMEDIA NEWS MARCH 30, 2011 COMMENTS (6)

[STORY](#)
[PHOTOS \( 1 \)](#)


Twins Daniel (left) and Henrik Sedin. File photo.

Photograph by: Ric Ernst, PNG files

### STORY TOOLS

[E-mail this Article](#)
[Print this Article](#)
[Comments \(6\)](#)
[Share this Article](#)

Font: [A](#) [A](#) [A](#) [A](#)

### RELATED STORIES FROM AROUND THE WEB

[Identical twins not actually identical, shocking Canadian research finds](#)

Windsor Star, Canada  
Wednesday, March 30, 2011

If you thought identical twins were identical, think again.

Canadian scientists have discovered that identical twins do not have identical genes, a common assumption by researchers for more than a century, and a development that could have implications into the study of medicine and human behaviour.

"That assumption has been with us since the beginning of time," said Shiva Singh, a molecular geneticist at the University of Western Ontario. "So this finding could be really revolutionary."

It was Singh's research into the relationship between heredity and schizophrenia that led him to his stunning discovery.

Singh had hypothesized that since the risk of developing schizophrenia is much higher if your siblings or your parents have the disease, the risk should be much greater for twins.

Identical, or monozygotic twins develop from a single fertilized egg that has split in two. Based on previous research, their genetic makeup should be identical.

So if the disease was related strictly to genes, the incidence for pairs of identical twins should be 100 per cent. But studies show that the risk of the disease in both twins is only 50 per cent.

Singh figured either the twins do not share exact copies of their genes or the disease involves other random effects.

But after sequencing the DNA of twins and their parents, and looking at one million differences between their genes, Singh concluded that twins are not actually identical.

"Our results have really forced everyone to rethink the idea that identical twins are actually identical," he said.

Singh said cells increase or decrease the number of genes that they contain as they replicate.

And it is the variations in which genes and how we express them that make each individual — even identical twins — genetically unique, he said.

"The implication would be that there is nobody with the human genome sequence," said Singh. "Everybody is different."

And because the process is constant, a pair of twins when they are 60 may have many more differences than when they are three years old, Singh said.

"The genome is very dynamic, not static. What you got from your parents is not what you have in the end," he said. "There is more to the story than that."

And he said the discovery could have major consequences for countless other fields, not just the biological sciences.

"If there are differences between twins, that could change the way research is conducted in a number of fields," Singh said.

Since the 1870s, when Sir Francis Galton published his work on what determines the characteristics of twins — nature versus nurture — they have been formal research subjects.

Because researchers could assume there would be no genetic differences between twins, they were the ideal test subjects for scientists examining everything from susceptibility to disease, to behavioural issues to psychological disorders.

One twin was the control and the other the variable.

But that luxury might no longer exist, said Singh, since everybody is a variable.