Detection of gene variation that leads to left-handedness

Researchers identified rare variants of a gene involved in controlling cell shape and found that the number of this gene variant was 2.7 times higher in left-handed people.

What do female singer Lady Gaga, former US President Barack Obama, billionaire Bill Gates, famous singer Paul McCartney and 'pop prince' Justin Bieber have in common with musician Jimi Hendrix, female star Judy Garland and the music legend? David Bowie music? All of them are left-handed, a trait found in only about 10% of the world's population.

But why are some people left-handed while most are right-handed? That is a question that scientists are actively researching to find an answer.

A study published in the journal Nature Communications on April 2 shed light on the genetic composition of left-handed people.

Researchers have identified rare variants of a gene involved in controlling cell shape and found that the number of these gene variants is 2.7 times higher in left-handed people.

Although these genetic variations account for only a very small portion - about 0.1% - of left-handed people, researchers say this gene, called TUBB4B, may play a role in the development of left-handed people. asymmetrical development of the brain, as a basis for determining which hand is more dominant.

In most people, the two hemispheres of the brain have slightly different anatomy and are responsible for performing different functions.

Neurobiologist Clyde Francks of the Max Planck Institute for Psycholinguistics in the Netherlands, who led the research, said that for most people, the left hemisphere is dominant in language and hemisphere functions. The right brain is dominant for spatial orientation.

In most people, the left hemisphere controls the right hand, he emphasized. The nerve fibers involved travel from left to right in the lower part of the brain. In left-handed people, the right hemisphere of the brain controls the dominant hand. The question is: what causes brain asymmetry to develop differently in left-handed people?

The TUBB4B gene controls a protein that is integrated into fibers called microtubules that provide internal structure to cells.

Mr. Francks said the identification of rare mutations in this gene that are more common in left-handed people suggests that microtubules are involved in establishing the brain's normal asymmetry. The two hemispheres of the brain begin to develop differently in human embryos, although the mechanism remains unclear.

Mr Francks added: 'Rare genetic variants in a small number of people can pinpoint genes that provide clues to the mechanism of asymmetrical development of the human brain. TUBB4B could be a good example.'

The findings are based on genetic data collected from more than 350,000 middle-aged to elderly people in the UK in a dataset called UK Biobank. Of these, about 11% are left-handed.

For most people, determining which hand is dominant can depend on the specific action. Mr. Francks said most cases of left-handedness occur simply due to random variations in embryonic brain development, with no specific genetic or environmental influences.

For example, random fluctuations in the concentrations of certain molecules during critical stages of brain formation.

According to the above expert, the new findings may show a connection to the field of psychiatry. Accordingly, the vast majority of left-handed people do not suffer from mental health problems, but people with schizophrenia are twice as likely to be left-handed or ambidextrous, and people with schizophrenia are twice as likely to be left-handed or ambidextrous. three times more likely to have autism.

Mr Francks explained: 'Certain genes that become active in the developing brain during early life may be associated with both brain asymmetry and psychiatric traits. Our study found suggestive evidence of this, and we have also seen it in previous studies when we looked at genetic variants that are more common in the population./.