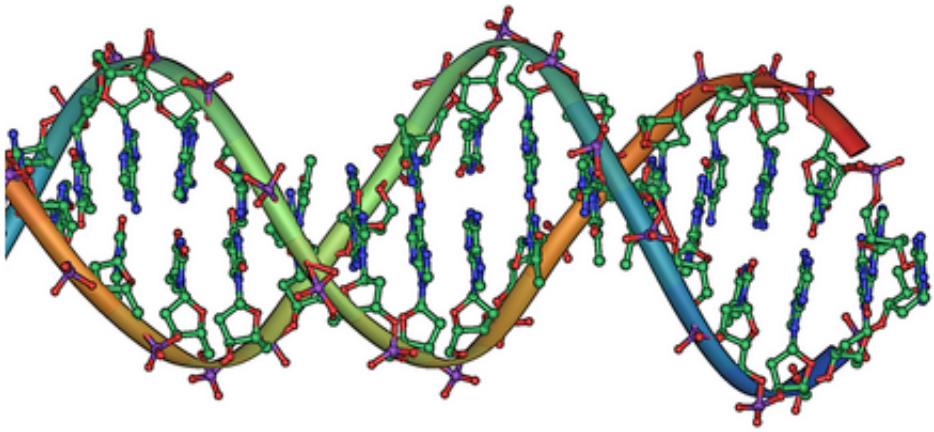
MedicalXpress

Study links gene to aggressive form of brain cancer

June 12 2015



DNA double helix. Credit: public domain

Scientists have identified a gene mutation linked to the development of an aggressive form of brain cancer.

Researchers found that errors in a gene known as TCF12 - which plays a key role in the formation of the embryonic brain are associated with more aggressive forms of a disease called anaplastic oligodendroglioma.

The new research is the largest ever genetic study of

oligodendrogliomas, and provides important insights into their causes - and how they might be treated.

Oligodendrogliomas are fast-growing cancers that account for around 5-10 per cent of all tumours of the brain and central nervous system, and typically have a very poor prognosis.

Researchers at The Institute of Cancer Research, London, in collaboration with laboratories in France and Canada, compared the genetic sequence of 134 of these brain tumours with the DNA of healthy cells.

The study was largely funded by Investissements d'avenir and Génome Québec, with support from Cancer Research UK, and was published in the journal *Nature Communications*.

Researchers identified mutations in the TCF12 gene in 7.5 per cent of anaplastic oligodendrogliomas. They found that this subset of cancers grew more rapidly, and in other ways seemed more aggressive, than those where the gene was intact.

TCF12 is the genetic code for a protein that binds to DNA and controls the activity of other genes. The researchers found that mutations in TCF12 rendered the protein less able to bind to DNA, and this in turn led to a reduction in activity of other key genes - including one already associated with cancer spread, known as CHD1.

The researchers initially read the DNA sequence of 51 tumours and went on to look for TCF12 mutations in an additional group of 83.

The researchers also discovered errors in the gene IDH1 in 78 per cent of the tumours, confirming the findings of an initial scan of the data.

Finding out more about what genetic faults cause anaplastic oligodendrogliomas will allow scientists and clinicians to develop new personalised therapies that target a range of the mutations driving the disease.

Professor Richard Houlston, Professor of Molecular and Population Genetics at The Institute of Cancer Research, London, said:

"Our in-depth study has set out many of the genetic defects that cause this rare but highly aggressive form of brain cancer - including identifying a gene mutation that appears in particularly fast-growing forms.

"Anaplastic oligodendrogliomas are difficult to remove by surgery and don't respond well to other forms of treatment. We hope this new information might be used to discover new targeted therapies, offering patients a better chance at survival from this aggressive cancer."

Provided by Institute of Cancer Research