

New route to leukemia uncovered

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Scientists from the Wellcome Trust/Cancer Research UK Gurdon Institute at the University of Cambridge studied a gene called JAK2 which is faulty in many cases of leukaemia - but until now its role was not clear.

They discovered that if JAK2 is faulty, the cell's meticulously controlled

message system 'short circuits'. As a result many genes are switched on and off inappropriately and a completely new cell signalling route by which leukaemia can develop is turned on.

The scientists found that the [enzyme](#) made by the JAK2 gene is also located inside the [cell nucleus](#) and plays an important role to control how [genetic information](#) is used by the cell. Previously it was only known to be located on the inner surface of cells - acting as a messenger between the outside of the cell and the cell's nucleus.

The team discovered that the JAK2 enzyme acts in the nucleus to switch on and off a number of genes. It does this by changing the structure of histones (the proteins that pack and protect DNA) and which control the behaviour of many [genes](#). The garbled messages from the faulty JAK2 gene lead to mismanagement of histones which results in catastrophic effects on the workings of a cell.

Lead author Professor Tony Kouzarides of the Wellcome Trust/Cancer Research UK Gurdon Institute at the University of Cambridge said: "This is a completely new route by which cancer can develop. In this exciting research we have revealed new unidentified parts of the cell's messaging system which can become faulty and lead to leukaemia."

In 2006, 7,237 people in the UK were diagnosed with leukaemia and the disease caused 4,350 deaths in the UK in 2007.

Professor Sir David Lane, Cancer Research UK's chief scientist, said: "This is important research which will help scientists find new and better ways to treat people with leukaemia."

Leukaemia can be difficult to treat because cancer cells are spread widely through the body so surgery is not an option. This makes it crucial to develop effective drugs to manage and treat the disease.

"These findings reveal a new route by which leukaemias develop - and gives scientists new opportunities to develop drugs which block it."

Provided by University of Cambridge ([news](#) : [web](#))

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