MedicalXpress

Opening the door to the cause of myeloid leukemia: Finding the targets of common mutation

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Researchers at the University of Birmingham have made a breakthrough in understanding how mutated genes in leukaemia reprogram blood stem cells and send them spiralling out of control.

The findings help to explain the early development of leukaemia, representing the essential first step to developing new treatments for patients based on these findings.

A study, published in *Cell Reports* by Professors Peter Cockerill and Constanze Bonifer, investigated the role of one specific mutation in the FLT3 gene found in acute myeloid leukaemia (AML).

AML is diagnosed in around 2,400 people in the UK each year. While younger patients have a better prognosis, overall survival rates are very poor and new treatments are needed.

FLT3 is a protein that normally makes sure that blood stem cells produce just the right number of blood cells every day. When it gets mutated it sends the wrong signals and keeps the stem cells expanding out of control, swamping the body with abnormal blood cells.

Professor Peter Cockerill, of the University of Birmingham, explained: "We found that the mutated FLT3 protein always sends the same signals to the same set of genes in all AML patients that have this mutation. By

finding out which signals and genes are the targets, we now have new targets that will allow us to attack this pathway."

The team found that the mutated FLT3 protein used one specific signalling pathway inside the cell to activate over 1,000 different targets within the DNA, leading to the abnormal activation of over 100 genes in patients who have this mutation. Many of these genes were already known to contribute to cancer by sending growth signals.

The project was funded by Leukaemia and Lymphoma Research. Dr Matt Kaiser, Head of Research at Leukaemia & Lymphoma Research, said: "Unfortunately there have been no significant improvements in survival rates for acute myeloid leukaemia in the last two decades. These findings provide renewed hope for developing new treatments for this aggressive type of leukaemia."

Provided by University of Birmingham