

The broken cell 'stopwatch': Discovery could lead to new leukaemia blood test

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(PhysOrg.com) -- Cardiff University scientists have pinpointed key changes in the cells of leukaemia patients which could play a crucial role in the earliest stages of the disease.

The research, led by Dr Duncan Baird at the School of Medicine, used pioneering techniques for measuring the length of tiny structures known as telomeres. These structures repeat sections of DNA which protect the ends of chromosomes during cell division. Each time a cell divides the telomeres get shorter, limiting the cell's lifespan.

Some cancer cells manage to bypass this safety check, allowing them to divide uncontrollably until the telomeres become so short they leave the chromosome ends completely exposed. This makes them prone to fusing together causing instability and large-scale DNA mutations that can speed up [cancer progression](#).

The new research, funded by Cancer Research UK and Leukaemia and [Lymphoma](#) Research, raises the prospect of developing a test to predict how quickly the telomeres are degrading. This in turn would signal how fast the leukaemia was progressing. It could also be a marker to help diagnose the disease earlier.

The findings have been published in the international journal *Blood*.

Dr Duncan Baird, lead author from Cardiff University, said: "This is the first time we've been able to directly show that shortened telomeres

could trigger the progression of cancer.

“Our research shows that telomere length could act as a kind of stopwatch to predict how fast the disease might progress in cancer patients.

“Being able to detect key changes in the cell that trigger the progression of leukaemia is exciting - it could one day lead to a blood test to predict how aggressive a patient’s cancer is, helping doctors decide on the best treatment option.

“We’re now looking to see if telomeres fusing together may be a driving force in the progression of other types of cancer, such as [bowel cancer](#).”

The researchers looked at blood samples from 41 chronic lymphocytic leukaemia (CLL) patients at different stages of the disease. They extracted chromosomes from the blood of these patients and measured the length of their telomeres.

The results showed that the [cancer cells](#) of patients at the most advanced stages of disease were more likely to have fused telomeres, suggesting that such events play a major role in the progression of the disease in these patients.

Dr Lesley Walker, director of cancer information at Cancer Research UK, said: “This discovery is incredibly exciting, especially if it can also be used to monitor disease progression in other types of cancer cell.

“Understanding the key events that trigger [cancer](#) in cells is crucial as it opens up the door for new drug targets for slowing the progression of the disease.”

Provided by Cardiff University

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