New test predicts survival in blood cancer patients

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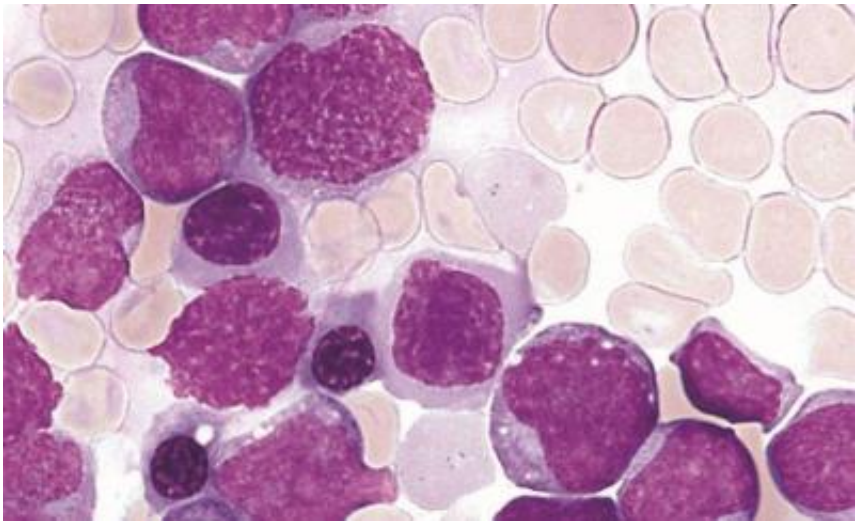

(Medical Xpress)—Scientists have developed a test which accurately predicts the prognosis for patients with the most common form of leukaemia.

The findings could also inform the development of a prognostic test for patients with other forms of cancer.

Researchers from the School of Medicine used pioneering techniques for measuring the length and function of tiny structures known as 'telomeres' – repeating sections of DNA found at the ends of

chromosomes.

They used these techniques to determine if the telomeres were working or not in cells from patients with chronic lymphocytic leukaemia (CLL). Patients with short dysfunctional telomeres displayed a considerably poorer clinical outcome compared to those with long and functional telomeres.

The study, which was funded by the blood cancer charity Leukaemia & Lymphoma Research and Cancer Research UK, is published online in the *British Journal of Haematology*.

CLL affects white blood cells in the bone marrow, causing a range of problems with the immune system. It is diagnosed in over 4,000 people a year in the UK and is currently incurable for most patients.

Professor Chris Pepper, who led the research at Cardiff University's School of Medicine, said: "For the first time, confident predictions of clinical outcome can be made for individual CLL patients at diagnosis based on accurate analysis of the length of telomeres in cancer cells. This should prove enormously valuable to doctors, patients and their families and there is no reason why there should not be widespread implementation of this powerful prognostic tool in the near future."

Giving patients an accurate prognosis has been a significant challenge for doctors. While some patients survive for just a few months after diagnosis, others can live for many decades and some may never need treatment. Predicting whether an individual patient's disease is likely to be aggressive or not will help doctors choose the most appropriate and effective treatment course.

Dr Matt Kaiser, Head of Research at Leukaemia & Lymphoma Research, said: "The accuracy of this test in predicting how a person's

disease will develop is unprecedented and, if confirmed in clinical trials, would help doctors decide on the best treatment courses for individual CLL patients. Telomeres are known to play a part in the progress of other forms of cancer, so this type of testing could have far-reaching benefits."

The progression of CLL and other cancers is known to be sped up by the loss of telomeres, which cap the ends of chromosomes and protect them from damage when a cell divides. Every time a cell divides, telomeres get shorter and when they get too short in a healthy cell, signals are sent to the cell to stop dividing and die. This 'safety check' does not kick in in CLL cells.

Telomeres become so short in CLL cells that chromosomes are left exposed and are prone to fusing together during cell division, causing even larger DNA faults and even greater instability.

Henry Scowcroft, science information manager at Cancer Research UK, said: "These promising findings need to be confirmed in larger trials, but being able to work out an accurate outlook for someone with CLL would help doctors tailor treatment more effectively. It could also have an important psychological benefit for patients who have just been told they have cancer.

"One of the most difficult aspects of a cancer diagnosis to cope with can be the waiting and uncertainty, and anything that could help patients plan their lives and immediate futures can only be a good thing."

The Cardiff researchers initially identified the critical telomere length at which fusions start to occur in samples from 200 CLL patients. They used a technology called Single Telomere Length Analysis (STELA). Telomere length was then checked against corresponding records of patient outcome. Just 13% of patients assigned to the poor prognosis

group were found to be alive after 10 years, compared to 91% of patients whose disease had been classified as being slow developing. These findings were then independently confirmed in a second cohort of 121 CLL patients.

Provided by Cardiff University