

Breast cancer drug could be used to treat life-threatening leukaemia

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Cancer cell during cell division. Credit: National Institutes of Health

A recently-approved breast cancer drug could be used to target and treat a life-threatening leukaemia, new research has revealed.

Experts at Newcastle University have identified that the drug, [palbociclib](#), used for advanced [breast cancer](#), can work effectively on treating [acute myeloid leukaemia](#) (AML).

Unlike current chemotherapy used to fight AML, palbociclib has significantly less toxic side-effects, such as irreversible heart damage and hair loss.

The study carried out on cell lines in the laboratory and on a mouse model, is published today in *Cancer Cell* and is a key step towards targeted treatment for adults and children with the serious condition.

It is hoped that this research development could increase survival rates for patients in the future.

Important step

Professor Olaf Heidenreich, from the Wolfson Childhood Cancer Research Centre at Newcastle University, jointly led the study with Professor Constanze Bonifer from the University of Birmingham.

He said: "Last year, palbociclib was approved for use in patients and was hailed by many experts as the most important breakthrough for women with [advanced breast cancer](#) in years.

"Our discovery that this treatment can be effective in AML is an important step towards a more effective and less toxic treatment for patients with this form of leukaemia.

"In addition to a significant number of treatment failures, long-term side effects such as cardiotoxicity or treatment-associated cancers are the scourge of current chemotherapy for AML.

"This discovery will help advance treatment without severely impairing patients' quality of life."

Palbociclib, which is taken in tablet form, can stop the spread of breast [cancer](#) in terminally ill patients for up to two years.

The treatment has been designed to thwart tumour growth by preventing key molecules of cell cycle progression from doing their job.

Specifically, palbociclib inhibits cyclin-dependent kinase 4 (CDK4) and closely-related CDK6; two factors that are essential to drive [cells](#) into DNA replication phase, which leads to cancer.

Cell screening

Scientists at the universities of Newcastle and Birmingham performed genomic analysis on AML cells and identified that two key molecules involved in the progression of leukaemia are CDK6 and CCND2.

As a result, it was established that the disease can be therapeutically targeted by repurposing palbociclib as the drug drives malignant CDK6 cells into death.

Professor Olaf said: "We are now carrying out research to identify combinations of medicines containing palbociclib that will effectively eradicate AML without causing substantial therapy-associated 'collateral damage'."

Each year, there are approximately 2,500 AML deaths in the UK and around 3,100 new cases of the disease.

More information: Natalia Martinez-Soria et al. The Oncogenic Transcription Factor RUNX1/ETO Corrupts Cell Cycle Regulation to

Drive Leukemic Transformation, *Cancer Cell* (2018). DOI: [10.1016/j.ccell.2018.08.015](https://doi.org/10.1016/j.ccell.2018.08.015)

Provided by Newcastle University

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