

Weeding out childhood leukaemia – fighting cancer with nature

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Credit: University of Bristol

New research, led by cancer biologists from the University of Bristol, has shown that bone marrow cells can protect cancer cells from a plant derived anti-cancer agent called Parthenolide.

Current therapies for children suffering from an aggressive type of [cancer](#) found in the blood, called t-cell acute lymphoblastic leukaemia (T-ALL), have increased survival rates to above 85% in developed countries. Unfortunately, some patients fail to respond to therapy and many suffer from serious side effects, highlighting the need to investigate other agents to treat this disease.

The agent Parthenolide (PTL) is a natural plant extract that has previously shown excellent anti-leukaemia activity with minimal effects on normal blood healthy blood cells. However, some populations of these [cancerous cells](#) unfortunately do remain resistant to Parthenolide.

The new study, published in the journal *Haematologica*, explores the mechanisms for this resistance. The study authors found that protection against PTL is provided by the release of

antioxidants by normal support cells derived from the bone marrow. By blocking the release of antioxidants a significant reduction in leukaemia cell resistance to PTL was seen.

Ben Ede, from Dr. Allison Blair's Cancer Stem Cell lab in the School of Cellular Molecular Medicine, and first author of the study said: "This research shines light onto a possible reason why T-ALL cells become resistant to therapy inside the body. By understanding the different ways [cancer cells](#) interact with normal healthy cells to survive this will help us to devise strategies to enhance new and in use therapies, for the benefit of children suffering from this terrible disease."

These findings indicate that it may be possible to improve the efficacy of PTL, as well as other chemotherapy drugs, by starving childhood T-ALL [cells](#) of anti-oxidants. The next step is to fully evaluate if blocking antioxidant release enhances anti-leukaemia drug effects in vivo.

More information: Benjamin C. Ede et al. Investigating chemoresistance to improve sensitivity of childhood T cell acute lymphoblastic leukemia to parthenolide, *Haematologica* (2018). [DOI: 10.3324/haematol.2017.186700](https://doi.org/10.3324/haematol.2017.186700)

Provided by University of Bristol

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