

Researchers reveal how a new class of drugs kills cancer cells

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Dr. Stefan Glaser from the Walter and Eliza Hall Institute. Credit: Walter and Eliza Hall Institute

A team of Walter and Eliza Hall Institute researchers has worked out how a new class of anti-cancer drugs kills cancer cells, a finding that

helps explain how cancer cells may become resistant to treatment.

The researchers studied a class of [anti-cancer drugs](#) called BET inhibitors, which are considered promising [new drugs](#) for the treatment of blood cancers such as leukaemias and lymphomas. BET inhibitors reduce [tumour growth](#) by blocking BET proteins, a family of proteins that control whether genes are switched on or off.

Although it has been known that BET inhibitors are effective at halting tumour growth, it has been unclear whether the drugs kill [cancer cells](#) outright or merely pause their growth.

Dr Zhen Xu, Professor David Huang, Dr Stefan Glaser and their colleagues have answered this question and in the process have identified potential ways in which cancer cells may develop resistance to BET inhibitors. Their findings have been published in the journal *Leukaemia*.

When tumours are treated with drugs, some [resistant cancer cells](#) can survive and continue to grow, leading to disease relapse.

The experiments performed by postdoctoral researcher Dr Xu revealed that BET inhibitors principally act to kill cancer cells through the process of apoptosis, or programmed cell death. Dr Xu showed that for BET inhibitors to successfully kill lymphoma and myeloid leukemia cells the presence of a protein called BIM, which brings on apoptosis, was critical.

"We found that when apoptosis was impaired, for instance by loss of BIM, the BET inhibitors were no longer effective," he said. "This suggests that cancer cells that acquire mutations in genes that drive apoptosis will lose sensitivity to BET inhibitors and thus will be able to survive treatment, leading to disease relapse."

Dr Glaser said understanding how BET inhibitors worked could help researchers develop improved strategies for using these drugs to treat cancer.

"Understanding how the drugs work gives us the opportunity to investigate new treatments, for example by using combination therapies, or altering the dosage and timing of treatment to prevent drug resistance from emerging," Dr Glaser said.

Provided by Walter and Eliza Hall Institute

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