

# Body kills 'spontaneous' blood cancers on a daily basis, research finds

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Associate Professor David Tarlinton, Dr. Stephen Nutt and Dr. Axel Kallies from the Walter and Eliza Hall Institute have found that the immune system removes errant B cells before they become cancerous. Credit: Walter and Eliza Hall Institute

Immune cells undergo 'spontaneous' changes on a daily basis that could lead to cancers if not for the diligent surveillance of our immune system, Melbourne scientists have found.

The research team from the Walter and Eliza Hall Institute found that

the immune system was responsible for eliminating potentially cancerous immune B cells in their early stages, before they developed into B-cell lymphomas (also known as non-Hodgkin's lymphomas). The results of the study were published today in the journal *Nature Medicine*.

This immune surveillance accounts for what researchers at the institute call the 'surprising rarity' of B-cell lymphomas in the population, given how often these spontaneous changes occur. The discovery could lead to the development of an early-warning test that identifies patients at high risk of developing B-cell lymphomas, enabling proactive treatment to prevent tumours from growing.

Dr Axel Kallies, Associate Professor David Tarlinton, Dr Stephen Nutt and colleagues made the discovery while investigating the development of B-cell lymphomas.

Dr Kallies said the discovery provided an answer to why B-cell lymphomas occur in the population less frequently than expected. "Each and every one of us has spontaneous mutations in our immune B cells that occur as a result of their normal function," Dr Kallies said. "It is then somewhat of a paradox that B cell lymphoma is not more common in the population.

"Our finding that immune surveillance by T cells enables early detection and elimination of these cancerous and pre-cancerous cells provides an answer to this puzzle, and proves that [immune surveillance](#) is essential to preventing the development of this blood cancer."

B-cell lymphoma is the most common blood cancer in Australia, with approximately 2800 people diagnosed each year and patients with a weakened immune system are at a higher risk of developing the disease.

The research team made the discovery while investigating how B cells

change when lymphoma develops. "As part of the research, we 'disabled' the T cells to suppress the immune system and, to our surprise, found that lymphoma developed in a matter of weeks, where it would normally take years," Dr Kallies said. "It seems that our immune system is better equipped than we imagined to identify and eliminate cancerous B cells, a process that is driven by the immune T cells in our body."

Associate Professor Tarlinton said the research would enable scientists to identify pre-cancerous cells in the initial stages of their development, enabling early intervention for patients at risk of developing B-cell lymphoma.

"In the majority of patients, the first sign that something is wrong is finding an established tumour, which in many cases is difficult to treat" Associate Professor Tarlinton said. "Now that we know B-cell lymphoma is suppressed by the [immune system](#), we could use this information to develop a diagnostic test that identifies people in early stages of this disease, before tumours develop and they progress to cancer. There are already therapies that could remove these 'aberrant' [B cells](#) in at-risk patients, so once a test is developed it can be rapidly moved towards clinical use."

**More information:** Fas ligand–mediated immune surveillance by T cells is essential for the control of spontaneous B cell lymphomas, [DOI: 10.1038/nm.3442](#)

Provided by Walter and Eliza Hall Institute

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