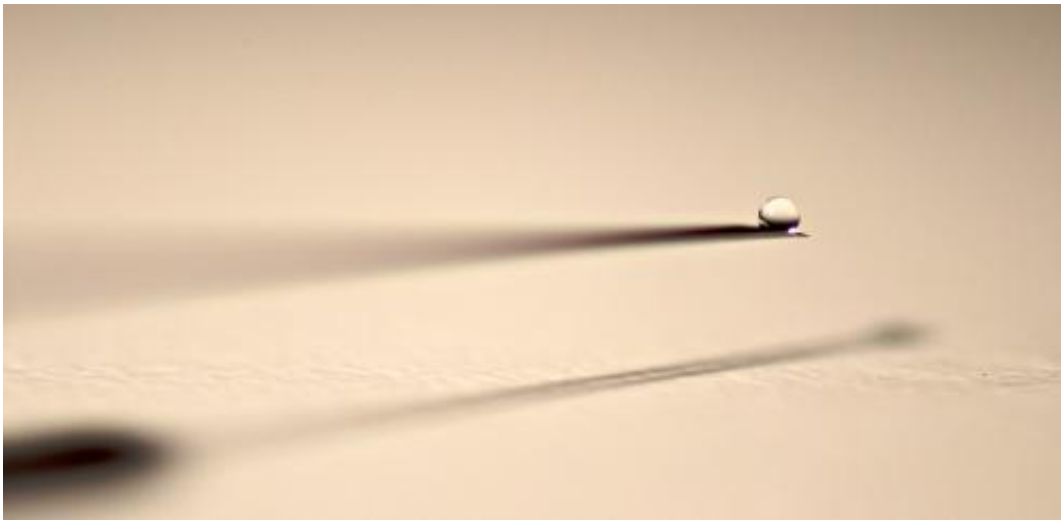


# Cancer vaccine a step closer as natural killer cells are rightly activated

March 25 2014, by Mohit Kumar Jolly

---



Saving lives with syringes and needles. Credit: benny4bs, CC BY-NC-SA

Vaccines work. Their widespread use has saved millions of lives. With an ageing population that is increasingly becoming a victim to cancer, a vaccine to treat it would do wonders. In a study published in [Nature](#), scientists have taken a step in that direction.

Few attempts to develop a [cancer vaccine](#) have been made, but the side effects have been overwhelming, such as the immune system turning against not just diseased but also [healthy cells](#). Researchers need to understand how to activate our immune system such that it kills only [cancer cells](#), and does not have any side effects.

In a new study, Josef Penninger at the Institute of Molecular Biotechnology of the Austrian Academy of Sciences and his colleagues have identified the [molecular mechanism](#) underlying this strategy.

The immune system protects human beings from diseases caused by viruses or parasites, and it even tries to fight cancer. It has the ability to distinguish external agents from our own healthy tissue, and kill them.

Natural killer (NK) cells in our immune system are like the soldiers of an army, they mediate a rapid response to an infection or a growing tumor. They constitute the first line of body's [defence mechanism](#). These cells can also inhibit the spread of cancer to different parts of the body, which is not only beyond the scope of current treatments such as chemotherapy and radiotherapy, but also accounts for more than 90% of deaths due to cancer.

Penninger has now shown, using mice that act as proxy for humans, that [natural killer](#) cells can be activated to inhibit the spread of cancer, and thus the survival of cancer patients can be prolonged, without any side effects.

First they showed that natural killer cells where a specific enzyme was not active killed target tumor cells more efficiently than natural killer cells that had normal enzyme activity. They also showed that cancer-bearing mice in which the enzyme, known as Cbl-b, had been deleted had fewer sites to which the cancer had spread, and a longer survival rate.

What's more is that the loss of Cbl-b did not lead to any side effects as seen with previous attempts to boost the immune system against cancer. The usual function of the enzyme is to help inhibit the immune response by preventing many lines of defence becoming active, including natural killer cells.

As an aside, understanding this mechanism helped Penninger answer how warfarin, a drug widely used to stop blood from clotting, also reduces cancer spread in mice. He showed warfarin adopts a similar strategy to activate [natural killer cells](#) by having a similar effect as that of the loss of Cbl-b. Thus, the hope is now that we can develop a vaccine that wakes up our immune system to stop the spread of cancer.

**More information:** "The E3 ligase Cbl-b and TAM receptors regulate cancer metastasis via natural killer cells." Magdalena Paolino, et al. *Nature* (2014) [DOI: 10.1038/nature12998](https://doi.org/10.1038/nature12998)  
Received 19 November 2012 Accepted 03 January 2014 Published online 19 February 2014

*This story is published courtesy of [The Conversation](#) (under Creative Commons-Attribution/No derivatives).*

Source: The Conversation

Citation: Cancer vaccine a step closer as natural killer cells are rightly activated (2014, March 25) retrieved 15 December 2022 from <https://medicalxpress.com/news/2014-03-cancer-vaccine-closer-natural-killer.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--