

Cancer: More targeted use of immunotherapy

June 12 2018



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Doctors are increasingly fighting cancer by stimulating patients' immune systems. SNSF-supported researchers have now discovered a method for predicting the likelihood of treatment success.

Immunotherapy changes a patient's [immune system](#) to allow it to attack cancer [cells](#) and either destroy them or at least keep them from growing. But the therapy only works for a minority of [patients](#). Researchers supported by the Swiss National Science Foundation (SNSF) have now discovered how to better predict who will respond to the therapy and who will not.

The key is a protein known as PD-1, which sits on the surface of [human immune cells](#). Until recently, PD-1 was regarded as their Achilles heel because [cancer cells](#) attach to the protein, thereby protecting themselves from immune system attack. "It's as though the tumour were wearing camouflage," says project lead Alfred Zippelius, deputy head of medical oncology at University Hospital Basel. Immunotherapy blocks the attachment site so the immune cells can "see" the cancer again.

An international research group led by Zippelius has now shown that immune cells with the most PD-1 are best able to detect tumours. In addition, these PD-1-rich cells secrete a signalling compound that attracts additional immune cells to help fight the cancer. "Therefore these patients have a better chance of responding to [immunotherapy](#)," says Daniela Thommen, first author of the study, who is currently at the Netherlands Cancer Institute in Amsterdam on an SNSF mobility fellowship.

Increasing the success rate

At present, still only a fraction of patients respond to immunotherapy. "If we could tell from the outset who the therapy will work for, we could increase the success rate. That would reduce side effects and also lower costs," says Zippelius.

The new findings will enable researchers to develop a practical tool that could ultimately help doctors to decide which patients will benefit from

a simple immunotherapy approach and which will require more intensive treatment—for example, a combination of chemotherapy and radiation. For that to happen, researchers must first find a way of distinguishing patients based on the amount of PD-1 in their [immune cells](#).

Immunotherapy is becoming increasingly important. "What's revolutionary about it is that some patients may remain cured after years of treatment—even in the case of tumours that have otherwise proved resistant to therapy," says Zippelius. In the meanwhile, University Hospital Basel has set up its own tumour board (a group of doctors with different specialities) for immunotherapy.

More information: Daniela S. Thommen et al, A transcriptionally and functionally distinct PD-1+ CD8+ T cell pool with predictive potential in non-small-cell lung cancer treated with PD-1 blockade, *Nature Medicine* (2018). [DOI: 10.1038/s41591-018-0057-z](https://doi.org/10.1038/s41591-018-0057-z)

Provided by Swiss National Science Foundation

Citation: Cancer: More targeted use of immunotherapy (2018, June 12) retrieved 26 April 2024 from <https://medicalxpress.com/news/2018-06-cancer-immunotherapy.html>

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