

The immune system's redesigned role in fighting cancerous tumors

March 12 2014

Researchers in the Cedars-Sinai Samuel Oschin Comprehensive Cancer Institute eradicated solid tumors in laboratory mice using a novel combination of two targeted agents. These two synergistic therapies stimulate an immune response, ultimately allowing solid tumors to act as their own cancer-fighting vaccine.

The study's findings, published in the journal *Cancer Research*, are the first to use these combined agents as an immune stimulator and may have the potential to kill cancerous cells in solid tumors, including some of the most aggressive cancers that form in the lung and pancreas. Investigators hope to bring this science to early-phase clinical trials in coming months.

"Instead of administering a cancer vaccine to destroy tumors, we hope to modify the immune system to allow the patient's own tumor to act as a cancer vaccine," said Hyung Lae Kim, MD, co-medical director of the Urologic Oncology Program and lead author of the study. "This approach differs from traditional methods, where the immune system is stimulated by administering a vaccine. Instead, we administer a combination therapy to allow [immune cells](#), which are capable of killing tumors, to see tumors that were previously invisible to the immune system."

When an immune system is working properly, diseased cells are captured and killed. However, [cancerous tumors](#) are formed when the immune system is unable to remove these [diseased cells](#). Using an

"mTOR inhibitor," which regulates cellular metabolism, and a CD4 antibody, which helps to initiate an [immune response](#), researchers increased the immune system's "memory" and ability to recognize and fight off tumors.

"With our approach, investigators simply combine an mTOR inhibitor and CD4 antibody to create an immunotherapy treatment, requiring no surgery and a drug with virtually no shelf life," said Robert Figlin, MD, deputy director of the Samuel Oschin Comprehensive Cancer Institute and the Steven Spielberg Family Chair in Hematology-Oncology. "This broad implication is in contrast to a more traditional vaccine-based approach, which requires a specialist to surgically remove tumor samples from a patient's body then create a personalized vaccine approach for one specific patient."

The combination of a CD4 antibody with an mTOR inhibitor may enhance [immune memory](#) and eradicate [solid tumors](#). Additional research is being done to better understand how the drugs work and develop optimal strategies for applications in patients.

More information: Citation: *Cancer Research*. 2014 February: Foxp3+ T cells inhibit antitumor immune memory modulated by mTOR inhibition.

Provided by Cedars-Sinai Medical Center

Citation: The immune system's redesigned role in fighting cancerous tumors (2014, March 12) retrieved 19 November 2023 from <https://medicalxpress.com/news/2014-03-immune-redesigned-role-cancerous-tumors.html>

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