

Stem cells, potential source of cancer-fighting T cells

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Adult stem cells from mice converted to antigen-specific T cells -- the immune cells that fight cancer tumor cells -- show promise in cancer immunotherapy and may lead to a simpler, more efficient way to use the body's immune system to fight cancer, according to Penn State College of Medicine researchers.

"Cancer immunotherapy is a promising method to treat cancer patients," said Jianxsun Song, Ph.D., assistant professor, microbiology and immunology. "Tumors grow because patients lack the kind of antigen-specific T cells needed to kill the cancer. An approach called adoptive T cell immunotherapy generates the T cells outside the body, which are then used inside the body to target [cancer cells](#)."

It is complex and expensive to expand T cell lines in the lab, so researchers have been searching for ways to simplify the process. Song and his team found a way to use induced pluripotent stem (iPS) cells, which are [adult cells](#) that are genetically changed to be stem cells.

"Any cell can become a stem cell," Song explained. "It's a very good approach to generating the antigen-specific T cells and creates an unlimited source of cells for [adoptive immunotherapy](#)."

By inserting DNA, researchers change the mouse iPS cells into [immune cells](#) and inject them into mice with tumors. After 50 days, 100 percent of the mice in the study were still alive, compared to 55 percent of control mice, which received tumor-reactive immune cells isolated from donors.

Researchers reported their results and were featured as the cover story in a recent issue of the journal *Cancer Research*.

A limitation of this potential therapy is that it currently takes at least six weeks for the iPS cells to develop into T cells in the body. In addition,

potential side effects need to be considered. iPS cells may develop into other harmful cells in the body.

Researchers are now studying how to use the process in human cells.

Provided by Pennsylvania State University

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