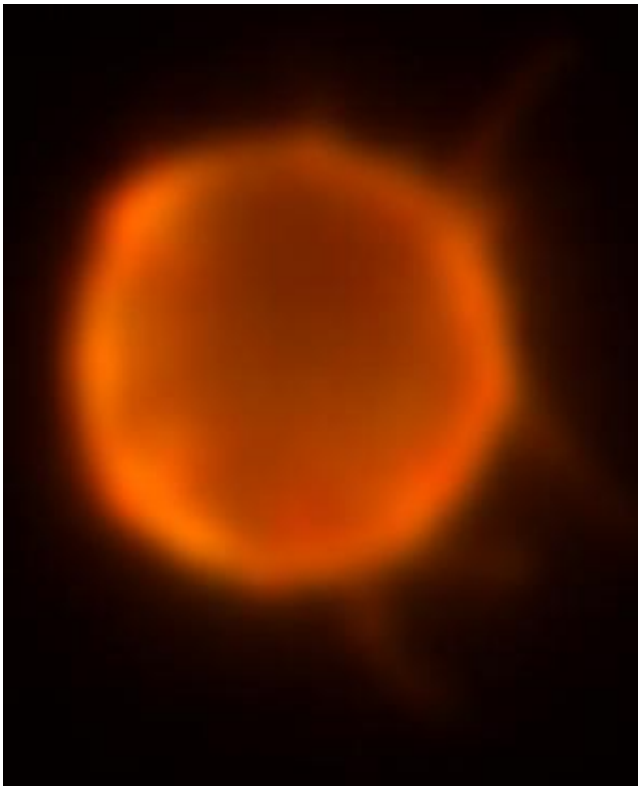


Natural (born) killer cells battle pediatric leukemia

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A leukemia cell coated with antibody is marked for destruction by activated natural killer cells. Credit: Children's Hospital Los Angeles

Researchers at Children's Hospital Los Angeles have shown that a select team of immune-system cells from patients with leukemia can be multiplied in the lab, creating an army of natural killer cells that can be used to destroy the cancer cells. Results of their in vitro study, published

August 19 in the journal *Leukemia*, could one day provide a less toxic and more effective way to battle this cancer in children.

Acute lymphoblastic leukemia (ALL) is the most common cancer of childhood. This disease hinders the development of healthy [blood cells](#) while [cancer cells](#) proliferate. Currently, children with ALL receive chemotherapy for two to three years, exposing them to significant side effects including changes in normal development and future fertility.

As a way to avoid these adverse effects, investigators have been researching how to supercharge the body's innate cancer-fighting ability – a technique called immunotherapy. One branch of the immune system – and a possible component of immunotherapy – includes a class of cells called natural killer (NK) cells. These specialized [white blood cells](#) police the body and destroy abnormal cells before they turn cancerous.

Using NK cells as immunotherapy presents challenges. If the cells come from a donor, the patient might reject the cells or worse, be at risk for graft-versus-host disease – where contaminating donor cells regard the patient's body as foreign and attack it. To avoid these problems, the researchers wondered if they could enlist the help of the patients' own, or autologous, NK cells. Using autologous cells would remove the risks associated with [donor cells](#).

But using autologous cells raised other issues. Would it be possible to multiply NK cells from patients with leukemia, even though they had very few to start with? Also, could the patient's own NK cells attack their leukemia... and win?

"In this study, we used NK cells and ALL cells from the same pediatric patients. We found that autologous [natural killer cells](#) will destroy the patient's leukemia cells," said Nora Heisterkamp, PhD, of The Saban Research Institute of Children's Hospital Los Angeles and one of the co-

lead investigators.

To help the NK cells identify their target as leukemia cells, the researchers also added a monoclonal antibody. Antibodies are normally made by cells of the immune system to identify and neutralize foreign material. Researchers can design and produce antibodies, called monoclonal antibodies (mAb), that specifically target a certain protein like the ones found on cancer cells. In a previous paper, Heisterkamp showed that a mAb targeted to a specific receptor (BAFF-R) on the [leukemia cells](#) stimulated the NK cells to attack and kill the cancer. The BAFF-R mAb was also used in this study.

"These results are very promising—with potential as a part of first line therapy and also as a treatment for eliminating any remaining cancer [cells](#), known as minimal residual disease, following standard chemotherapy," said Hisham Abdel-Azim, MD, of Children's Hospital Los Angeles and co-lead investigator on the study. "We anticipate additional pre-clinical testing and then, a clinical trial to evaluate the therapy in children with leukemia."

Provided by Children's Hospital Los Angeles

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