This microscopy image provided by Dr. Carl June on Wednesday shows immune system T-cells, center, binding to beads which cause the cells to divide.

‘Amazing’ therapy wipes out leukemia in study

By Stephanie Nano
Associated Press

NEW YORK—Scientists are reporting the first clear success with a new approach for treating leukemia — turning the patients' own blood cells into assassins that hunt and destroy their cancer cells.

They've only done it in three patients so far, but the results were striking: Two appear cancer-free up to a year after treatment, and the third patient is improved but still has some cancer. Scientists are already preparing to try the same gene therapy technique for other kinds of cancer.

"It worked great. We were surprised it worked as well as it did," said Dr. Carl June, a gene therapy expert at the University of Pennsylvania. "We're just a year out now. We need to find out how long these remissions last."

He led the study, published Wednesday by two journals, New England Journal of Medicine and Science Translational Medicine.

It involved three men with very advanced cases of chronic lymphocytic leukemia, or CLL. The only hope for a cure now is bone marrow or stem cell transplants, which don't always work and carry a high risk of death.

Scientists have been working for years to find ways to boost the immune system's ability to fight cancer. Earlier attempts at genetically modifying bloodstream soldiers called T-cells have had limited success; the modified cells didn't reproduce well and quickly disappeared.

June and his colleagues made changes to the technique, using a novel carrier to deliver the new genes into the T-cells and a signaling mechanism telling the cells to kill and multiply.

That resulted in armies of "serial killer" cells that targeted cancer cells, destroyed them, and went on to kill new cancer as it emerged. It was known that T-cells attack viruses that way, but this is the first time it's been done against cancer, June said.

For the experiment, blood was taken from each patient and T-cells removed. After they were altered in a lab, millions of the cells were returned to the patient in three infusions.

The researchers described the experience of one 64-year-old patient in detail. There was no change for two weeks, but then he became ill with chills, nausea and fever. He and the other two patients were hit with a condition that occurs when a large number of cancer cells die at the same time — a sign that the gene therapy is working.