$14M Federal Grant to Research CAR-T Gene Therapy to Cure HIV

This strategy entails genetically modifying a person's stem cells to give rise to T cells that target and destroy cells infected with HIV.

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A group of collaborating scientists received a $13.65 million federal grant to study and develop a CAR-T therapy that will genetically modify immune cells and potentially cure HIV, according to a press release from the University of California, Los Angeles (UCLA).

The National Institutes of Health (NIH) funds the five-year grant as part of its effort to support HIV cure research. Participating researchers are affiliated with UCLA, the University of Washington–Fred Hutchinson Cancer Research Center and CSL-Behring, a biotech company based in the United States and Australia.

"The overarching goal of our proposed studies is to identify a new gene therapy strategy to safely and effectively modify a patient's own stem cells to resist HIV infection and simultaneously enhance their ability to recognize and destroy infected cells in the body in hopes of curing HIV infection," said UCLA's Scott Kitchen, PhD, an associate professor of medicine in the division of hematology and oncology, in the press release. Kitchen will colead the research with Irvin Chen, PhD, director of the UCLA AIDS Institute at the David Geffen School of Medicine.

Transplantation of HIV-resistant stem cells is the only approach that has ever led to a known cure for HIV (and likely a second such cure). But stem cell transplants are risky and can only be done in people with HIV who need them for cancer treatment. Using gene therapy to modify an individual's own stem cells might be a safer way to achieve the same result.

The Food and Drug Administration first approved CAR-T therapy—which stands for chimeric antigen receptor T-cell therapy—in 2017. It's used to treat some forms of cancer, but as POZ's sister publication Cancer Health has reported, it hasn't been commonly used because it is expensive and must be custom made for each patient.

In the case of cancer treatment, CAR-T therapy involves taking a patient's T cells and sending them to a lab where they are genetically modified to recognize and attack the cancer. The resulting cells are then infused back into the individual after the person has received strong chemotherapy to kill off some of their existing immune cells to make room for the new ones.

In CAR-T therapy for HIV, blood-forming stem cells would be genetically engineered to give rise to T cells that would seek out and destroy cells infected with HIV.

In a recent early study of the approach, the UCLA scientists found that engineered CAR T cells destroyed HIV-infected cells and lived for more than two years.

“Our work under the NIH grant will provide a great deal of insight into ways the immune response can be modified to better fight HIV infection,” said Chen, a professor of medicine and of microbiology, immunology and molecular genetics at the Geffen School of Medicine. “The development of this unique strategy that allows the body to develop multiple ways to attack HIV could have an impact on other diseases as well, including the development of similar approaches targeting other types of chronic viral infections and cancers.”

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