

# Potential cure for HIV discovered



AFP/File Photo: People light candles placed on the symbolic red AIDS ribbon during a remembrance ceremony for...

by Mira Oberman  
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CHICAGO (AFP) - In a breakthrough that could potentially lead to a cure for HIV infection, scientists have discovered a way to remove the virus from infected cells, a study released Thursday said.

The scientists engineered an enzyme which attacks the DNA of the HIV virus and cuts it out of the infected cell, according to the study published in Science magazine.

The enzyme is still far from being ready to use as a treatment, the authors warned, but it offers a glimmer of hope for the more than 40 million people infected worldwide.

"A customized enzyme that effectively excises integrated HIV-1 from infected cells in vitro might one day help to eradicate (the) virus from AIDS patients," Alan Engelman, of Harvard University's Dana-Farber Cancer Institute, wrote in an article accompanying the study.

Current treatments focus on suppressing the HIV virus in order to delay the onset of [AIDS](#) and dramatically extend the life of infected patients.

What makes [HIV](#) so deadly, however, is its ability to insert itself into the body's cells and force those cells to produce new infection.

"Consequently the virus becomes inextricably linked to the host, making it virtually impossible to 'cure' AIDS patients of their HIV-1 infection," Engelman explained.

That could change if the enzyme developed by a group of German scientists can be made safe to use on people.

That enzyme was able to eliminate the HIV virus from infected human cells in about three months in the laboratory.

The researchers engineered an enzyme called Tre which removes the virus from the genome of infected cells by recognizing and then recombining the structure of the virus's DNA.

This ability to recognize HIV's DNA might one day help overcome one of the biggest obstacles to finding a cure: the ability of the HIV virus to avoid detection by reverting to a resting state within infected cells which then cease to produce the virus for months or even years.

"Numerous attempts have been made to activate these cells, with the hope that such strategies would sensitize the accompanying viruses to antiviral drugs, leading to virus eradication," Engelman wrote. "Advances with such approaches in patients have been slow to materialize."

New experiments must be designed to see if the Tre enzyme can be used to recognize these dormant infected cells, he wrote.

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"Although favorable results would represent perhaps only a baby step toward eventual use in patients, the discovery of the Tre recombinase proves that enzymatic removal of integrated HIV-1 from human chromosomes is a current-day reality," he said.

The researchers who developed the enzyme were optimistic about their ability to design additional enzymes which would target other parts of the virus's DNA.

However they warned that there were significant barriers to overcome before the enzyme could be used to help cure patients.

"The most important, and likely most difficult, among these is that the enzyme would need efficient and safe means of delivery and would have to be able to function without adverse side effects," wrote lead author Indrani Sarkar of the Max Planck Institute for Molecular Cell Biology and Genetics in Dresden.

"Nevertheless the results we present offer an early proof of principal for this type of approach, which we speculate might form a useful basis for the development of future HIV therapies," Sarkar concluded.

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