CRISPR Gene Editing Successfully Snips HIV Out of Live Mice

The feat marks an important milestone in the mammoth effort to find a cure for HIV.

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For the first time, scientists have used the powerful cutting-edge CRISPR/Cas9 gene-editing method to cut HIV out of infected mice, CBS News reports. This feat "represents an exciting milestone in moving the [HIV cure research] field toward human trials," remark researchers in an editorial accompanying the published paper about the study.

Publishing their findings in Molecular Therapy, scientists used three different types of mouse research models to explore the potential of their CRISPR/Cas9 HIV-gene-editing system. In a study published in 2016, the same researchers showed that they could use these effective genetic scissors to snip HIV genes out of cells in tissue cultures taken from rats and mice.

In the first mouse model they employed in the new study, the researchers used CRISPR/Cas9 to reduce the capacity for HIV-infected cells in transgenic mice (mice altered to have relevant humanlike genetic qualities) to express viral RNA (the virus's genetic materials) by about 60 to 95 percent. This effectively confirmed the investigators previous tissue-culture research findings.

Next, they tested the gene-editing system in mice acutely (very recently) infected with EcoHIV, the mouse equivalent of human HIV. CRISPR/Cas9 proved highly effective at eradicating the virus from mouse cells and preventing spread of the infection throughout the body.

Last, the researchers used mice genetically engineered to have human immune cells, including CD4s. They infected the animals with cells latently infected with HIV to effectively create a viral reservoir. (A latently infected cell is not replicating, which means it can fly under the radar of standard antiretroviral treatment, which can go after HIV only when the cell the virus infects is replicating.) The cells were embedded into various tissues and organs.

A single CRISPR/Cas9 treatment in these mice successfully snipped HIV out of the transplanted cells.

Up next: The researchers are working toward advancing their research into primates, which more closely resemble humans genetically. They hope to demonstrate success in cutting HIV out of reservoir cells in such animals, including from brain cells.

To read the study, click here.

To read a press release about the study, click here.

To read the accompanying editorial, click here.

To access the CBS News report, click here.

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