Cure: Cracking CRISPR

Trying to mimic the “Berlin Patient” cure, researchers edited the CCR5 gene in the immune stem cells of a man with leukemia and HIV.

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Marking an important debut effort in what may be a long road toward employing the CRISPR gene-editing method to cure HIV in humans, researchers have found that using the technology to edit immune stem cells proved safe, even if their effort to eradicate the virus failed. A Chinese research team used CRISPR to edit the hematopoietic stem and progenitor cells (HSPCs) of a 27-year-old man who had HIV and acute lymphoblastic leukemia. HSPCs give rise to the blood cells that make up the immune system. The edit aims to make them resistant to HIV by removing CCR5 receptors the virus uses to enter cells. In 2017, the researchers succeeded in using CRISPR to excise HIV from the immune cells of mice. While the transplant of the edited cells has apparently put the man’s leukemia into remission, it did not cure his HIV. The bright side is that the gene-edited cells have persisted in his body for more than 19 months. However, only about 5% of his CD4 cells have the edit that makes them resistant to HIV.
