Cure: Gene Editing

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Scientists have succeeded in drawing stem cells from pigtail macaque monkeys, editing them to produce immune cells resistant to SHIV, a simian form of HIV, and engrafting them back into the animals' bodies. This so-called autologous transplant gave rise to a significant population of SHIV-resistant immune cells and shrank the size of the viral reservoir in monkeys that had SHIV and were on antiretrovirals. The gene editing caused new CD4 cells to lack a functioning CCR5 coreceptor on the surface of the immune cell, which is what most HIV attaches to in order to infect the cell. (If the cell does not have a functioning coreceptor, most virus cannot infect the cell.) Compared with control monkeys that did not receive the transplant of gene-edited stem cells, the monkeys that received the transplant had lower levels of SHIV DNA and RNA in their tissues, indicating success in shrinking the viral reservoir.

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