Antibody Infusion Prompts Long-Term Suppression of Simian HIV in Some Monkeys

They received two weeks of infusions of two antibodies after being infected with simian-human immunodeficiency virus (SHIV).

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A treatment with two broadly neutralizing antibodies against HIV given very soon after a group of monkeys were infected with simian-human immunodeficiency virus (SHIV), a hybrid of HIV's simian cousin, SIV, and HIV, prompted some of the animals to fully suppress the virus over an extended period.

Publishing their findings in the journal Nature, researchers infected 13 macaque monkeys with SHIV. Three days later, after infections had been clearly established in the animals, the researchers gave each of them three intravenous infusions of two broadly neutralizing antibodies over a two-week period.

Each of the antibodies, 3BNC117 and 10-1074, binds to a different site on the surface of SHIV. Together, they helped prompt the immune system to neutralize and clear the virus.

After studying the individual effects of broadly neutralizing antibodies against the virus, including VRC01 and N6, HIV researchers are beginning to investigate using such virus-fighting elements in combination to improve their overall power, similar to the way multiple antiretroviral (ARV) drugs are used in standard HIV treatment.

For the first 56 to 177 days after the treatment, the monkeys in this new study maintained undetectable viral loads. Then the virus rebounded in all but one of the animals. However, after an additional five to 22 months, the immune systems of six monkeys wrested control of the virus again and returned the viral load to undetectable for another five to 13 months. These six animals kept key immune cells at healthy levels.

Four additional monkeys did not go on to reestablish an undetectable viral load after their rebound. However, their immune systems suppressed the virus to extremely low levels nevertheless. Like the six monkeys that fully suppressed the virus, they kept healthy levels of key immune cells, for two to three years after being infected with SHIV.

That meant that just three of 13 monkeys did not benefit from the antibody treatment.

In order to learn what role CD8 “killer” cells played in controlling SHIV in this study, the researchers gave the six monkeys with full control of the virus an antibody that targets and lowers levels of CD8 cells. As these immune cells were subsequently depleted in these animals, their SHIV levels rose, leading the investigators to conclude that CD8 cells were pivotal in controlling the virus after the antibody therapy.

Other ongoing studies are investigating the effects of giving the dual antibody treatment to monkeys two to six weeks after infection with SHIV. This more closely parallels the earliest window during which humans may feasibly test positive for HIV after infection and possibly receive a similar treatment.

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

To read the study abstract, click here.

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