

Researchers use antibody treatment to protect humanized mice from HIV

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NIH-funded scientists have shown that boosting the production of certain broadly neutralizing antibodies can protect humanized mice from both intravenous and vaginal infection with HIV. Humanized mice have immune systems genetically modified to resemble those of humans, making it possible for them to become HIV-infected.

Led by David Baltimore, Ph.D., of the California Institute of Technology, the investigators inserted the genes encoding the NIH-discovered broadly HIV neutralizing antibody VRC01 into a vector, a virus that infects [mice](#) but does not cause disease. In a unique technique known as vectored immunoprophylaxis (VIP), the researchers infected [laboratory mice](#) with this altered virus, enabling certain of their cells to produce the antibodies for extended periods. To test the applicability of this approach to human infections, the researchers used a novel method of repeatedly exposing these mice to low doses of HIV in a manner that mimics human sexual intercourse. In two separate experiments, the investigators assessed protection from infection with two strains of HIV: a standard laboratory strain as well as one that is commonly transmitted among humans.

Two of the 10 mice expressing VRC01 antibodies became infected with the laboratory strain of HIV after 13 to 15 exposures to the virus. In contrast, all nine mice without the antibodies were infected with HIV within six exposures. In the second experiment, researchers used a modified form of the VRC01 antibody, known as VRC07, and challenged the mice with an HIV strain known to be heterosexually

transmitted among people. The mice expressing the VRC07 antibody were completely resistant to infection during repeated intravaginal challenge. Taken together, these results indicate that VIP can protect mice from infection with strains of HIV that cause human disease and suggest that a similar strategy could be developed to reduce transmission in people, the authors write.

More information: Balazs AB et al. Vectored immunoprophylaxis protects humanized mice from mucosal HIV transmission. *Nature Medicine*. DOI: [10.1038/nm.3471](https://doi.org/10.1038/nm.3471) (2014).

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