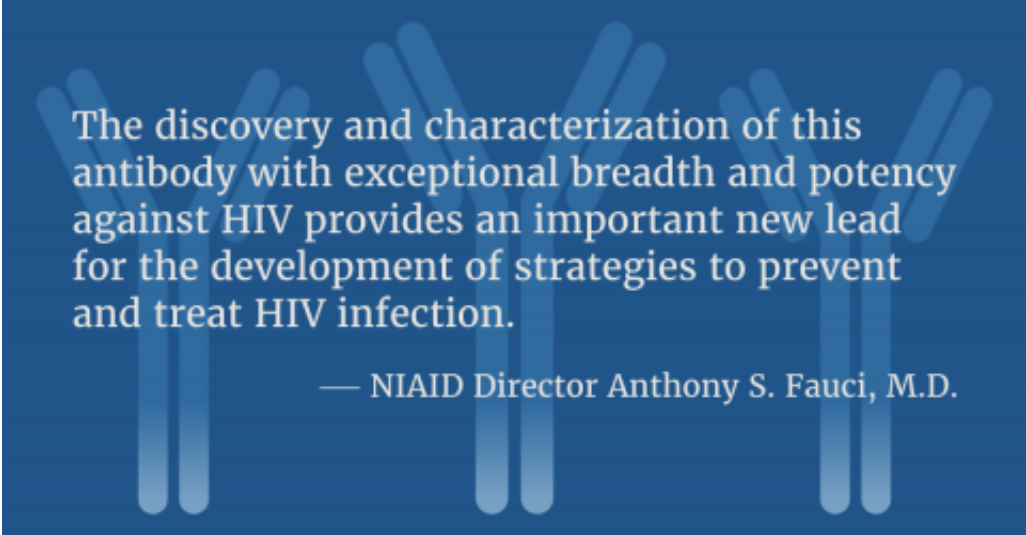


Scientists identify potent antibody that neutralizes nearly all HIV strains

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The discovery and characterization of this antibody with exceptional breadth and potency against HIV provides an important new lead for the development of strategies to prevent and treat HIV infection.

— NIAID Director Anthony S. Fauci, M.D.

Scientists from the National Institutes of Health have identified an antibody from an HIV-infected person that potently neutralized 98 percent of HIV isolates tested, including 16 of 20 strains resistant to other antibodies of the same class. The remarkable breadth and potency of this antibody, named N6, make it an attractive candidate for further development to potentially treat or prevent HIV infection, say the researchers.

The scientists, led by Mark Connors, M.D., of NIH's National Institute

of Allergy and Infectious Diseases (NIAID), also tracked the evolution of N6 over time to understand how it developed the ability to potently neutralize nearly all HIV [strains](#). This information will help inform the design of vaccines to elicit such broadly neutralizing [antibodies](#).

Identifying broadly neutralizing antibodies against HIV has been difficult because the virus rapidly changes its surface proteins to evade recognition by the immune system. In 2010, scientists at NIAID's Vaccine Research Center (VRC) discovered an antibody called VRC01 that can stop up to 90 percent of HIV strains from infecting human cells. Like VRC01, N6 blocks infection by binding to a part of the HIV envelope called the CD4 binding site, preventing the virus from attaching itself to immune cells.

Findings from the current study showed that N6 evolved a unique mode of binding that depends less on a variable area of the HIV envelope known as the V5 region and focuses more on conserved regions, which change relatively little among HIV strains. This allows N6 to tolerate changes in the HIV envelope, including the attachment of sugars in the V5 region, a major mechanism by which HIV develops resistance to other VRC01-class antibodies.

The new findings suggest that N6 could pose advantages over VRC01, which currently is being assessed as [intravenous infusions](#) in clinical trials to see if it can safely prevent HIV infection in humans. Due to its potency, N6 may offer stronger and more durable prevention and treatment benefits, and researchers may be able to administer it subcutaneously (into the fat under the skin) rather than intravenously. In addition, its ability to neutralize nearly all HIV strains would be advantageous for both prevention and treatment strategies.

More information: J Huang, BH Kang, E Ishida, T Zhou et al. Identification of a CD4-binding site antibody to HIV that evolved near-

pan neutralization breadth. *Immunity*, DOI:
[10.1016/j.immuni.2016.10.027](https://doi.org/10.1016/j.immuni.2016.10.027)

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