HIV antibodies block infection by reservoir-derived virus in laboratory study

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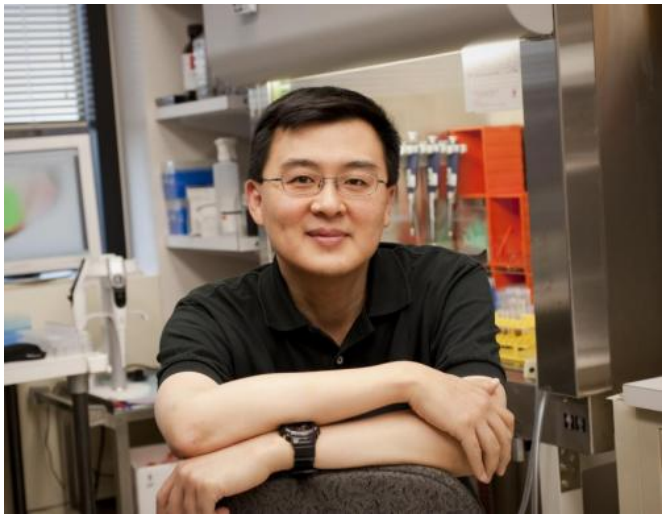

Tae-Wook Chun, Ph.D., staff scientist in the NIAID Laboratory of Immunoregulation and first author of the study. Credit: NIAID

A laboratory study led by scientists from the National Institute of Allergy and Infectious Diseases, part of the National Institutes of Health (NIH), lends further weight to the potential effectiveness of passive immunotherapy to suppress HIV in the absence of drug treatment. Passive immunotherapy for HIV is an experimental strategy that involves periodically administering broadly neutralizing HIV-specific antibodies (bNAbs) to control the virus. It would be advantageous to control HIV without antiretroviral drugs because of their cost, the potential for cumulative toxicities from lifelong therapy, and the difficulties some patients have adhering to drug regimens and tolerating certain drugs.

Although bNAbs have proven effective at blocking infection by various strains of HIV in the laboratory, their effect on HIV in humans, and particularly on the virus particles that hide in immune cells (called latent viral reservoirs), has been unknown.

In this study, NIH scientists obtained HIV from the latent reservoirs of 29 infected people in whom antiretroviral therapy fully inhibited viral replication. In the laboratory, the researchers found that several bNAbs—particularly PGT121, VRC01 and VRC03 —effectively blocked HIV from entering the CD4+ T cells obtained from uninfected healthy donors. In addition, the scientists demonstrated in the laboratory that these antibodies could completely block HIV replication in CD4+ T cells obtained from infected individuals receiving antiretroviral therapy.

The researchers conclude that passive immunotherapy involving bNAbs individually or in combination may control HIV in the absence of antiretroviral therapy. A number of clinical trials are already underway or planned to test this hypothesis.

More information: T-W Chun, et al. Broadly neutralizing antibodies suppress HIV in the persistent viral reservoir. *PNAS* DOI: 10.1073/pnas.1414148111 (2014).

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