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Researchers induce HIV-neutralizing antibodies that recognize HIV-1 envelope protein, lipids

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For the first time, researchers have experimentally induced antibodies that neutralize HIV-1 and simultaneously recognize both HIV-1 envelope protein and lipids. The results were reported by U.S. Military HIV Research Program (MHRP) researchers on Aug. 25 in the online version of *AIDS,* the official journal of the International AIDS Society.

The lead investigators, Dr. Gary Matyas and Dr. Carl Alving, researchers in the Division of Retrovirology, MHRP, Walter Reed Army Institute of Research (WRAIR), and their collaborators, conducted the exploratory study using small synthetic HIV-1 peptides encapsulated in liposomes containing lipid A as an adjuvant.

The monoclonal antibodies, produced after immunizing mice, have binding characteristics that look similar to two well-known broadly neutralizing human monoclonal antibodies, known as 2F5 and 4E10, which also bind to HIV-1 protein and lipid. These antibodies, 2F5 and 4E10, are widely viewed as models of the types of neutralizing antibodies that might be useful in an effective HIV-1 vaccine. Until now, the HIV field has been unable to induce neutralizing antibodies that have both protein-binding and lipid-binding characteristics similar to 2F5 or 4E10. This study employed widely used, clinically acceptable, well-tolerated and relatively inexpensive generic antigen-adjuvant constituents that potentially could be used as part of a human formulation.

Dr. Carl Alving, Chief of the Department of Adjuvant and Antigen Research, said, "Some of the strongest naturally occurring antibodies that broadly neutralize HIV have the unique characteristics of recognizing both HIV protein and lipid. It has been believed that it might be difficult to induce such antibodies experimentally, and historically, this has been considered a potential roadblock to creation of an effective HIV vaccine. This study demonstrates that such antibodies might be induced with immuno-stimulating liposomes."

Source: Henry M. Jackson Foundation for the Advancement of Military Medicine