Scientists Discover and Target HIV's Weak Spot

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"Super" antibodies known as abzymes can overcome one of HIV's most clever methods of escaping the immune system, say the authors of a study published in the June 2008 issue of *Autoimmunity Reviews* and reported in Science Daily.

The antibodies that most people's immune systems make are largely ineffective against HIV. Researchers have also had great difficulties developing a vaccine that produces human antibodies that can effectively combat the virus. One reason is that HIV's outer coat—its envelope—easily changes shape, or mutates, and therefore eludes antibodies.

Recently, however, Sudhir Paul, PhD, and two other scientists at the University of Texas at Houston, including the study's lead author, graduate student Stephanie Planque, discovered a small portion of the HIV envelope that must remain unchanged for the virus to be infectious. This portion of the HIV envelope escapes attack by most people's immune systems because the virus is able to prevent antibody producing B cells from producing antibodies against it.

Paul's team, however, has found that people with the autoimmune disease lupus, along with a small segment of people with HIV who do not get sick, are able to produce abzymes that target this protected region of HIV's envelope. In test tubes, Paul found that these abzymes not only recognized the protected region, but also succeeded in damaging and destroying the viruses they interacted with.

Researchers at the University of Texas are preparing to test the abzymes as a therapeutic in people with HIV. Researchers are also exploring the use of abzymes in microbicide gels to prevent HIV infection.