# Mapping Viral and Immune Coevolution

June 25, 2013 By Benjamin Ryan

---

For the first time, scientists have mapped the coevolution of HIV and the corresponding immune response in a single person, which has provided vital clues that may help vaccine development. Investigators sponsored by the National Institute of Allergy and Infectious Diseases (NIAID) analyzed weekly blood samples from one African man beginning four weeks after he was infected and continuing for more than three years.

The researchers were able to chart the virus as it evolved and eventually prompted the man's immune system to produce what are known as "broadly neutralizing antibodies," which in his case had the capacity to prevent infection in up to 55 percent of the world's known HIV strains.

Over the past few years, researchers have made increasing strides in understanding the function and development of these antibodies, which prevent infection by attaching to the virus's outer envelope and blocking the virus's entry into cells. About one in five people with HIV will eventually develop broadly neutralizing antibodies after about one to two years, but research suggests they often do so, as in the case of this man, after the viral population has mutated enough to evade the antibodies' effects. The hope is to develop a vaccine that could harmlessly imitate the virus at pivotal steps in this evolutionary process, prompting the body to produce broadly neutralizing antibodies on its own that block HIV infection.

NIAID director Anthony S. Fauci, MD, says the recent finding is "an important conceptual advance in how you might use a vaccine strategy to guide and coax the immune response along the pathway to a broadly neutralizing antibody."

---

© 2026 Smart + Strong All Rights Reserved.
http://beta.docker.poz.com/article/vaccine-development-24141-4007