Lens Into Specific Antibody Evolution May Foresee HIV Vaccine

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Researchers have mapped the development of a key antibody as well as its interplay with HIV over time, establishing scientific knowhow that may aid in the development of a vaccine. Researchers at the National Institute of Allergy and Infectious Diseases (NIAID)—which is a division of the National Institutes of Health (NIH)—along with the Centre for the AIDS Programme of Research in South Africa (CAPRISA) and other groups studied an antibody that targets a site known as V1V2 on the virus and published their findings in Nature.

V1V2 is rare in that it does not apparently change as the viral population mutates. Thus, if a vaccine could target this site, it would likely have success whereas an attempt to go after a site inclined to mutate would fail. Research has suggested that antibodies targeting V1V2 helped prevent the spread of HIV in the one vaccine trial that has thus far showed moderate success.

In this study, the researchers found an individual in the CAPRISA cohort who, severl months after contracting HIV, naturally developed a neutralizing antibody, called CAP256-VRC26, that targeted V1V2. The scientists charted the evolution of this antibody by analyzing samples taken between 15 weeks and four years after the volunteer was infected.

The researchers were able to determine the genetic makeup of the original antibody and then map the antibody as it mutated and became more potent and effective. They were also able to detail the interchange between the virus and the antibody and to understand how this interaction fueled the ultimate development of the antibody into a powerful anti-HIV agent.

They found that not much time was required for the antibody to evolve and become particularly potent. Consequently, a vaccine targeting V1V2 would be more likely to succeed because fewer steps would be required to get the antibody to evolve to the desired form. Researchers have already begun work on attempting to develop a vaccine that could both prompt the body to produce V1V2-centric neutralizing antibodies and coax them into maturing into an effective means of protecting against the virus.

To read the NIH release, click here.

To read the Nature abstract, click here.

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